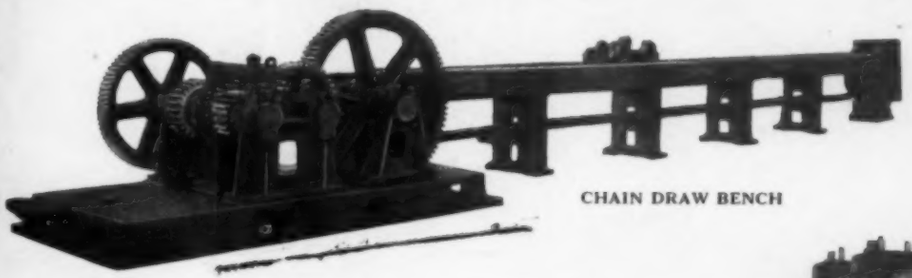
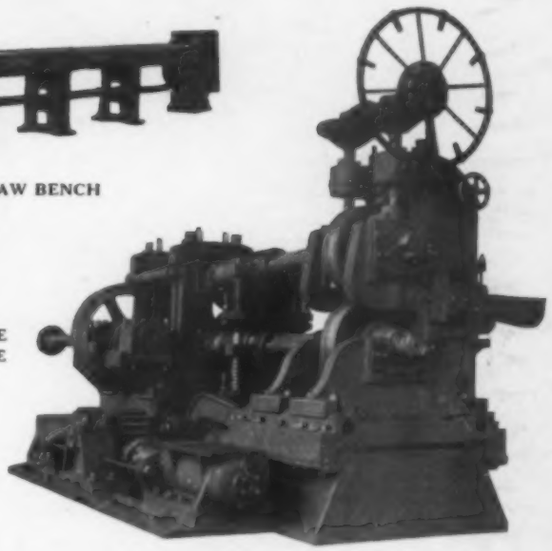
MACHINERY ISSUE

THE IRON TRADE REVIEW

Single Copies 15 Cents | CLEVELAND, MAY 2, 1918 | Four Dollars a Year



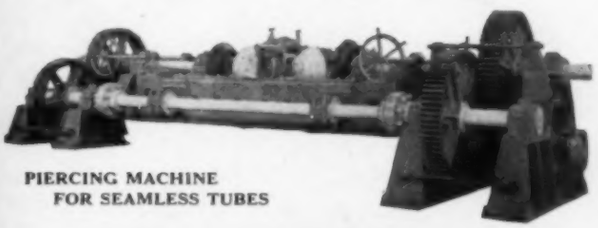
CHAIN DRAW BENCH



WELDING MACHINE FOR LAP WELD PIPE

MAY 3 1918

ROLLING MILL FOR SEAMLESS TUBES



PIERCING MACHINE FOR SEAMLESS TUBES

MACHINERY FOR MAKING

SEAMLESS TUBES

LAP and BUTT WELD PIPE

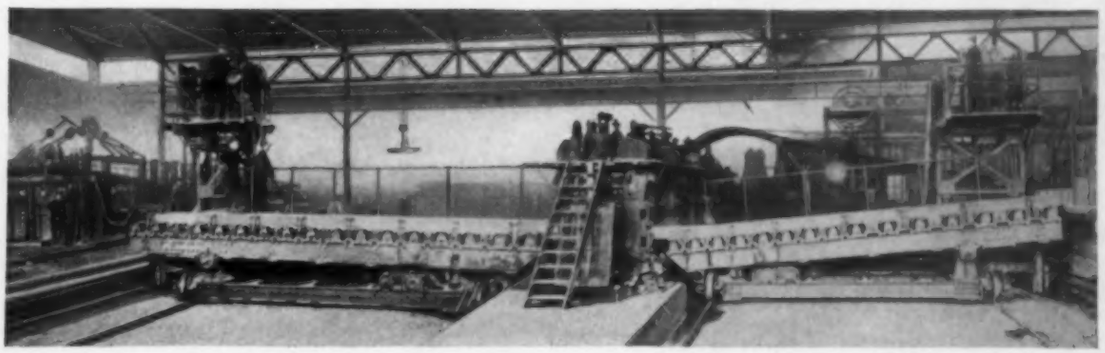
PIPE THREADERS AND CUTTERS

ROLLING MILLS

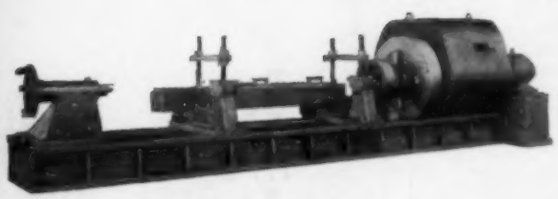
(SAND) ROLLS (CHILLED)

Standard Engineering Co.

ELLWOOD CITY, PA., U. S. A.



22" BAR MILL



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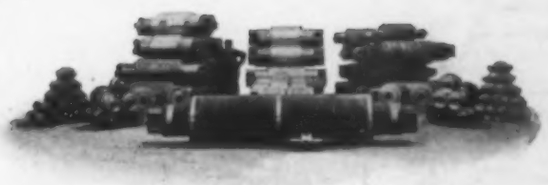

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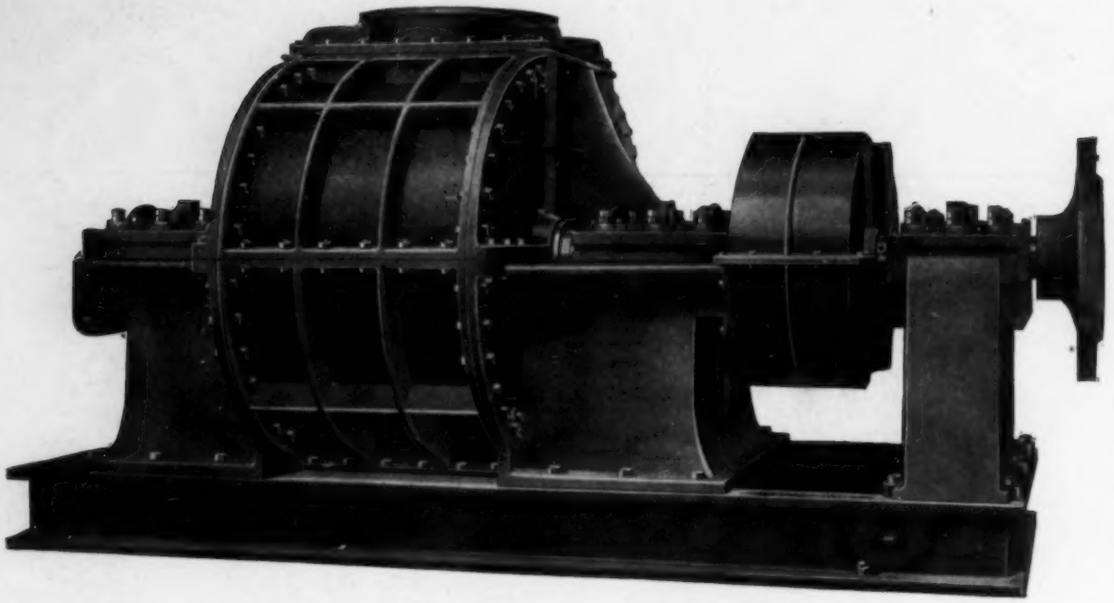

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CONNERSVILLE

Gas Pumps, Exhausters and Boosters

CONNERSVILLE GAS PUMPS, EXHAUSTERS and BOOSTERS are exceptionally advantageous wherever gas is handled.

Although they are the type of simplicity, they possess all the features of practical construction, resulting from years of experience.

CORRECT

The testimonials which we have received from users of CONNERSVILLE PUMPS, EXHAUSTERS and BOOSTERS, prove that "Connersville" products are correct both in design and service. Many state that they out-work as well as out-last the best pumps that they have ever been able to obtain.

EFFICIENT

Their range of capacity is from 25 to 40,000 cu. ft. per minute, and their pressure range is from ½ to 10 pounds. There is no lost motion—all motion is rotary, parts being carefully balanced and separated by accurately gauged clearances. There are no valves, no springs, and no internal parts requiring lubrication.

SERVICEABLE

The service to which CONNERSVILLE PUMPS, EXHAUSTERS and BOOSTERS can be put, is almost unlimited. They can be used for handling air, gas, steam, water and all other fluids.

These pumps may be driven by belt, by direct connected steam engine, by electric motor direct connected or through gear and pinion, or by silent chain.

If you wish correct and efficient pump service write for a "CONNERSVILLE" catalog.

THE CONNERSVILLE BLOWER CO.

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929 Monadnock Bldg.

CONNERSVILLE, IND.

NEW YORK
114 Liberty St.

THE IRON TRADE REVIEW

Vol. LXII Cleveland, May 2, 1918 *No. 18*

Whole Industry at War's Call

Commercial Business is Plunged in Greater Uncertainty by Pledge of Producers of 100 Per Cent Output to Government—Pig Iron Makers Prepare for More Effective Co-operation—Car Prices Disappoint

IF THE WAR shall require it, the steel industry is prepared to put approximately 32,000,000 to 33,000,000 tons of rolled products annually at the disposal of the government. This is the literal significance of the formal pledges now being given by producers generally to the government that their full capacity is subject to call and that all commercial business is to be subordinated. The statement has been made officially by the steel director that military necessities are so great that they will absorb a 100 per cent output in almost all lines. This is suggestive of the fact that unparalleled war demands now are approaching ultimate form. The experiences of Great Britain, France and even Germany in the present war, however, raise the question in many capable quarters whether such a tremendous application of tonnage would be required for an indefinite period. This dedication of the whole industry to the war is in sequence to recent events and to the sweeping new policies covering orders and distribution which the war industries board has been weighing, as outlined a week ago.

Pig Iron on War Basis

Washington's keener appreciation of the serious situation in pig iron has been brought to a head by the large tonnage represented by government requirements. It is felt that maximum production in iron is necessary to keep pace with the great war needs in steel. Producers foreseeing the inevitable conscription of output and the readjustment of old orders are seeking the adoption of more effective methods of distribution through government representatives. Under this plan complete control of output would be vested in the committee on pig iron, ore and lake transportation and the government's needs would be filled promptly to the exclusion of all present obligations and contracts. The government soon is to make a heavy demand for basic iron for plants producing shell steel. A further need of 400,000 to 600,000 tons of basic, foundry and malleable is represented by the castings for the large car order. It is believed it will be necessary to allocate much of this tonnage. The 20,000 tons of bessemer needed for France will be supplied by a New Jersey furnace company which is to receive an equal tonnage of lake ore for the conversion.

Force Close Car Prices

A month of haggling over specifications and prices on the part of the purchasing powers of the railroad commission has brought forth the long delayed, though vitally needed, car and locomotive orders. There is manifest dissatisfaction in the equipment industry over the close bargain which the director of purchases has forced upon it. The terms provide for a profit of 5 to 6 per cent on manufacturing cost. If the cost exceeds the estimate the percentage of profits must absorb this margin. On the other hand, if the costs fall below the estimate the government is to get the benefit of the saving. The division of the 100,000 cars gives 30,000 to the American Car & Foundry Co.; 13,500 each to the Standard Steel Car Co. and the Pressed Steel Car Co.; 7500 each to the Pullman Co. and Haskell & Barker Co.; and 3000 each to the Ralston Steel Car Co., Mt. Vernon Car Mfg. Co. and Cambria Steel Co. The remaining 19,000 cars now are being distributed. Owing to the urgent demand for plates for shipbuilding and for steel for other purposes, large use is to be made of wooden designs. Nevertheless, the steel requirement in total remains heavy. Under the government locomotive program an initial order for 1025 has been divided between the American Locomotive Co. and the Baldwin Locomotive Works. Approximately 200,000 tons of steel are involved in this order.

Scrap dealers have won their fight for a commission allowance on sales. The war industries board has given official approval to a rate of 3½ per cent, but has left its payment optional with the consumer. It is believed that this action will lift the market out of its recent uncertainty. Whether this commission ruling can be regarded as establishing a precedent for other lines of iron and steel is not yet clear.

MAY 2, 1918

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metalworking Industries.

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Meeting the Iron Shortage

PROPER and timely appreciation of the pig iron shortage which has been overhanging the country for months is being shown by the government. It has been realized by those charged with the vital duty of keeping the war machine promptly and adequately supplied with the essential products of iron and steel that the pig iron situation has been one of the danger spots. The 1,500,000 tons slump of output in the November-March period and the continuing hampering of production by fluctuating coke supplies presents a margin of loss that must be compensated for in some way. This factor has assumed increased importance because of the 100 per cent output for war purposes which the government now is urging upon the steel manufacturers. It has been in steel-making iron especially where the shortage has been felt most. This has lead the steel director's office in recent weeks to commandeer surplus basic stocks in steel works yards in behalf of consumers in less favored positions. It is announced that sales henceforth must be in accordance with government business.

This commandeering of tonnage now and the increasing allocations through the government where iron cannot be had by consumers themselves, who are executing war orders, points the way to what may be expected in a far greater degree after midyear. The number of consumers who have found it impossible on their own initiative to buy iron covering their needs over the last six months of the year is large. It generally is appreciated in the industry that this fact is certain to intensify the future effects arising from a condition of short supply.

The government is recognizing the fallacy which repeatedly has been pointed out by THE IRON TRADE REVIEW of permitting pig iron distribution to follow usual commercial channels, if essential needs are to be served first. It has been shown that this in the end only has meant conscription of tonnage already sold and increased complications and confusion. If it is so vital that the government shall have, temporarily at least, 100 per cent of steel output, a corresponding supervision over the supplying of the raw material from which this tonnage is to be made, is equally necessary. The prime duty of the government is to see that the iron being made is placed at the disposal of those who ought to have it in the order of their importance as providers of essential products. The pig iron producers are loyally rallying to the aid of the government. They have proposed plans whereby the imperative needs for iron may be met speedily and old business subordinated. This involves the sacrifice of many high-priced orders, but it is the price of patriotism which they are cheerfully paying.

Railway Shop Equipment Needed

CAR shortage has been the diagnosis advanced for the transportation ills of last winter. Lack of motive power and slowness in repairing rolling stock and equipment have been symptoms accompanying and contributing to these ills; but as in the case of purely physical disorders, malnutrition resulting in this case from excessive economy during the last few years was the one fault which produced the breakdown. By no means the least important cause was the limitation which has been placed on the engineering departments of some roads with regard to the purchase of machine tools for the shops. Roads which were notable exceptions to this policy of restriction did not crack under the strain last winter.

The process of purchasing tools for a railroad involves necessary delays at the best. The master mechanic makes a request for needed machines to the superintendent of motive power of the division. The mechanical engineers of the motive power department pass judgment upon the requirements, and the list as approved is passed to the executive department for permission to make the purchase. It is then given to the purchasing department. Lists are submitted to the machine tool trade and proposals are taken. These are tabulated and checked by the engineers of the motive power department, who often exercise their judgment to the point of selecting the more expensive tools where the need demands. In the past, the lists

of requirements, in many cases, have been sliced as mercilessly as a peace time congressional navy appropriation. The error of this procedure was demonstrated last winter.

At the present time it is, of course, necessary to submit the amount desired for machine tools to the government's regional committee in charge of the railroads. No definite statement has been made as to the policy which will be followed in allowing these appropriations nor as to whether the separate organizations of the different roads will be allowed to proceed to make needed replacements in shop power tools. It is to be hoped earnestly, however, that the existing methods for handling the purchase of machinery may be allowed to proceed with the utmost speed. Replacements are badly needed, and although the types of machines used in the railway shops do not conflict with those used on most munitions work, some serious delay may intervene in securing deliveries. At the present time most of the railroads have extensive tool lists awaiting approval, and apprehension has existed in some quarters that the group or zone plan of purchasing this machinery might be considered. It is not believed feasible by either the railway executives or the machinery interests to handle the purchasing in this way, from the fact that very few duplicate machines are to be found even in the requirements of two divisions of the same road. This removes the one advantage to quantity buying. Considerations based upon the familiarity of machinists with types of tools at present installed, and questions of policy and engineering judgment condemn the centralizing of the purchasing agencies for railway shop tools.

Putting Patriotism Above Profits

THE spirit of loyalty and co-operation with which machine tool builders generally are striving to serve the government at this time is reflected in a communication recently addressed by a large manufacturer of the middle west to his district representatives. In commenting upon the scarcity of certain tools it was explained that in ordinary times great effort is made to have representatives receive tools in proportion to the size and importance of the territory they cover, but that in the present emergency such a policy would be subordinated so that the best distribution could be made "regardless of present profit or future advantage". It appealed to representatives that they "ignore entirely advantages that may accrue by placing machines in hands of desirable customers", and further implored them to assist customers to secure maximum production with present equipment regardless of make. Doubtless, it added, there are many cases where the purchase of a machine may be thereby avoided. In all cases, the communication stated, the company must have complete assurance that the use to which machines are to be placed, is essential to the war or the maintenance of necessary industry.

With these and other like statements, the company went on to discourage many practices of ordinary business which in the past have meant much in the way of profit and the development of its commercial position. That the dealers will respond to this highly patriotic appeal, even though it may cost much in the way of profits, there is reason for little doubt. In fact, a transformation has been going on steadily for months, until now it may be regarded that the spirit of the communication quoted is general throughout the machine tool industry. Still there are some interests who, perhaps due to the isolated positions of their plants or, possibly, to the character of the work in which they were engaged prior to the war, have yet to swing over and enter whole-heartedly into the business of winning the war. To these and to others who have not yet felt the urgency of co-operation and the need for self-sacrifice, this quiet, unobstrusive inter-office communication of a middle western tool builder carries a tremendous appeal.

Ties Welded in Blood

ANNUAL meetings of the National Metal Trades association these past twenty years have been businesslike affairs, with a minimum of time wasted on irrevelant subjects. In this respect, they have been unlike some other conventions, where two-thirds of the delegates have gossiped in the halls, while the faithful "old guard" applauded the speakers. Yet this year the association gave up an hour or two of its limited time to a famous comedian. A breath of the bonnie heather wafted in the meeting room of the Astor, inspiring the delegates there to even a deeper realization than before, of the wrenched hearts of our allies across the sea and their determined will to defeat a cruel enemy. Harry Lauder is a comedian no longer, for he has shared in his country's sorrow. His mission now is to help "brea-ak the German hear-rt". In the space of 10 minutes after he had finished his eloquent address the 300 delegates present had subscribed $7000—not to the Liberty loan nor to the American Red Cross nor anything else American—but to the Harry Lauder "million-pun-fund" for the rehabilitation of crippled British soldiers. What better proof is needed that American business has made common cause, heart and soul, with England, than this spontaneous response to such a call? The incident is only a straw, but it points the direction of a mighty current that will one day sweep the Kaiser and the Potsdam gang into oblivion.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 1156

PIG IRON

Bessemer, valley	$35.20
Bessemer, Pittsburgh	36.15
Basic, Pittsburgh	32.95
Basic, eastern Pa.	32.00
Basic, Buffalo	32.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
Malleable, Philadelphia	34.00 to 37.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry, N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	36.40
No. 2 southern, Chicago	37.50
No. 2 southern, Phila. del.	38.30 to 39.40
No. 2 southern, Cleveland	37.50
No. 2 southern, Boston	39.50
No. 2 southern, St. Louis	35.90
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	36.77
Virginia, No. 2X, Jersey City	37.02
Virginia, No. 2X, Boston	37.27
Gray forge, Pittsburgh	32.95
Silveries, 8 per cent, furnace	46.00
Silveries, 8 per cent, Chicago	48.54
Low phos. standard, Phila.	55.00 to 56.00
Low phos., Lebanon, furnace	50.00
Low phos., Pittsburgh	53.00
Charcoal, Superior, Chicago	37.50
Charcoal, Superior, Buffalo	39.75
Charcoal, southern furnace	43.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	7.00
Wise county furnace	6.00
Wise county foundry	7.00

FERROALLOYS

Ferromanganese, 80 per cent delivered	$290.00
Ferromanganese, 70 per cent delivered	250.00
Spiegel, 16 per cent fur., spot	75.00
Spiegel, contracts, furnace	70.00
Ferrocarbon titanium, carloads, maker's plant	200.00
Ferrosilicon, 50 per cent, second quarter, Pitts.	170.00 to 185.00
Ferrosilicon, 50 per cent, Pitts., remainder of 1918	155.00
Bessemer ferrosilicon, 9 per cent.	$54.00
Bessemer ferrosilicon, 10 per cent.	55.00
Bessemer ferrosilicon, 11 per cent.	58.30
Bessemer ferrosilicon, 12 per cent.	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	50.50
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.00

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pittsburgh	2.90c
Sheared skelp, Pittsburgh	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chgo.	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.095c
Bars, soft steel, Phila.	3.085c
Bar iron, Chicago	3.50c
Bar iron, Phila.	3.50c to 3.685c
Bar iron, Cleveland	3.64c to 3.70c
Bar iron, New York	3.50c to 3.695c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	5.115c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pbgh.	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, ¾ in. proof coil, Pitts.	8.00c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.215c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.465c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.465c
No. 10, open-hearth, Phila.	4.435c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base Pittsburgh	Black Per cent off	Galv. Per cent off
⅛ to 3 in., butt, steel	51	37½
¾ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3¼ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

(Class B Pipe)

Four-inch, Chicago	57.30
Six-inch and over, Chicago	54.30
Four-inch, New York	58.35
Six-inch and over, N. Y.	55.35
Four-inch, Birmingham	52.00
Six-in. and over, Birmingham	49.00

HOOPS, BANDS, SHAFTING

Class A pipe is $1 higher than Class B.

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	2.90c
Shafting, Pitts., carloads	17 off to list
Cotton ties, May, per bundle	$1.91

RIVETS

Structural rivets, Pittsburgh	4.65c
Boiler rivets, Pittsburgh	4.75c
Rivets ⅞ in. & small., Pitts.	45 and 10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(¾ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(¾ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semifinished hexagon nuts ¾ in. and larger	60–10–10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products May 1, average for April, 1918, average for February, 1918, and average for May, 1917. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices May 1, 1918	Average prices April, 1918	Feb., 1918	May, 1917
Bessemer pig iron, Pittsburgh	$36.15	$36.15	$37.25	$44.95
Basic pig iron, Pittsburgh	32.95	32.95	33.95	42.15
*No. 2 Foundry pig iron, Pitts.	33.95	33.95	33.95	43.55
*No. 2, Foundry pig iron, Chi.	33.00	33.00	33.00	43.20
Lake Superior charcoal, Chicago	37.50	37.50	37.50	49.25
Malleable, valley	33.50	33.50	33.50	42.70
Malleable, Chicago	33.50	33.50	33.50	43.20
**Southern, No. 2, Birmingham.	33.50	33.50	33.50	35.75
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	38.60
Basic, eastern Pa.	32.00	32.00	33.00	40.75
**No. 2X Virginia, furnace	33.50	33.50	33.50	41.00
**No. 2X foundry, Philadelphia	34.25	34.25	34.25	43.25
Ferromanganese, 70%, delivered.	250.00	250.00	250.00	425.00
Bessemer billets, Pittsburgh	47.50	47.50	47.50	85.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	88.00
Open-hearth sheet bars, Pitts.	51.00	51.00	51.00	88.00
Open-hearth billets, Pitts	47.50	47.50	47.50	85.00
Steel bars, Pittsburgh	2.90	2.90	2.90	3.50
Steel bars, Chicago	2.90	2.90	2.90	3.84
Iron bars, Philadelphia	3.50	3.50	3.50	4.109

	Prices May 1, 1918	Average prices April, 1918	Feb., 1918	May, 1917
Iron bars, Cleveland	$3.64	3.64	3.64	3.25
Iron bars, Chicago mill	3.50	3.50	3.50	3.39
Beams, Chicago	3.00	3.00	3.00	4.34
Beams, Pittsburgh	3.00	3.00	3.00	4.00
Beams, Philadelphia	3.185	3.185	3.185	4.659
Tank plates, Pittsburgh	3.25	3.25	3.25	4.50
Tank plates, Chicago	3.25	3.25	3.25	5.49
Tank plates, Philadelphia	3.435	3.435	3.435	7.559
Sheets, blk., No. 28, Pitts.	5.00	5.00	5.00	7.00
Sheets, blue anld., No. 10, Pitts.	4.25	4.25	4.25	6.65
Sheets, galv., No. 28, Pitts.	6.25	6.25	6.25	8.80
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Connellsville furnace coke	6.00	6.00	6.00	8.00
Connellsville foundry coke	7.00	7.00	7.00	8.50
Heavy melting steel, Pitts.	29.00	29.00	30.00	28.40
Heavy melting steel, eastern Pa.	28.50	28.30	30.00	26.00
Heavy melting steel, Chicago	29.00	28.65	30.00	28.70
No. 1 wrought, eastern Pa.	34.00	34.00	35.00	40.75
No. 1 wrought, Chicago	33.50	33.50	35.00	36.40
Rerolling rails, Chicago	34.00	34.00	35.00	36.80

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

(For Additional Prices See Page 1156)

Placing Pig Iron on War Footing

Producers Plan Reallocation of Tonnage and More Comprehensive System of Distribution Which Will Give War Needs Precedence Over Other Business—Big Demand in Sight—20,000 Tons for France Placed

Pittsburgh, April 30.—Preliminary plans for placing the pig iron industry on a strictly war footing were discussed April 25 at the regular monthly meeting of the Cleveland district of the American Pig Iron association, which was held at the William Penn hotel, this city. It is proposed to work out the details of this new policy at a meeting to be held in Cleveland on Friday of the current week by the committee on pig iron, ore and lake transportation. Among other things, the proposed plan will involve the reallocation of tonnages and the systematizing of distribution. It is confidently expected that the entire industry readily will agree to the proposal. Once the latter is put into operation, the government through the committee is to have absolute control of the pig iron output to the exclusion of all requirements, regardless of contracts or other obligations that furnaces now may have. Contracts, deliveries, tonnages involved, output, etc., will be canvassed. In other words the industry will be operated as a single unit so that it will be on a basis similar to that to which the steel trade rapidly is being shifted, and in the future 100 per cent of the pig iron output will be placed at the disposal of the government. It then will rest with those having charge of the distribution of tonnages to provide iron for consumers who first will have to secure government permits, or "procurement orders", as they will be called. Among those who addressed the meeting of the Cleveland district of the American Pig Iron association here last week were Edmund W. Mudge of Edmund W. Mudge & Co., Pittsburgh, and C. D. Dyer, vice president of the Shenango Furnace Co., and president of the American Pig Iron association. Those attending were urged to provide iron as fully as possible for the committee on pig iron, ore and lake transportation immediately, to serve the government first and to make commercial requirements secondary. By this plan nonessentials will be eliminated altogether. The meeting was devoted particularly to the comparing of statistics as to costs and production and was presided over by R. C. McMahon of M. A. Hanna Co., of Cleveland, in the absence of T. W. Friend, vice president of the Cleveland district of the association and treasurer of the Clinton Iron & Steel Co., Pittsburgh. Inquiries continue to come to makers for iron, but practically all furnaces are fully committed for the entire year and sales made represent only small lots of off grades. A consumer who recently put out an urgent inquiry for 10,000 tons of basic has been unable to cover in this district.

Embargoes Still Hamper

Boston, April 29.—Deliveries of pig iron on contract in this territory continue quite satisfactory on government or embargo committee permits, but while there are melters here who could use more iron than they are getting, inquiries are not especially numerous, nor is much new business being booked. The furnaces apparently are more intent on catching up with the orders on hand than in seeking new business. The iron coming forward is practically all for government work, but in view of the

fact that almost all melters in New England, with the possible exception of some of the stove concerns, are directly or indirectly engaged on government orders, probably very few outside of the exceptions are not getting some of the iron arriving. The New Haven road is still embargoed on inward freight, suggesting a continued congestion on the Pennsylvania and within the past day or two the Boston & Albany has imposed an embargo. This leaves the Boston & Maine the only clear line for New England deliveries outside of shipments accompanied by special permits. Congestion on the New York Central lines east of Rochester probably explains the Boston & Albany embargo.

Eastern Market is Stagnant

New York, April 29.—The only sizable pig iron business transacted in this district during the past week was approximately 2000 tons of southern foundry for second half. The Wharton, N. J., furnaces, however, will make and ship 20,000 tons of bessemer to France during the June-September period under government allocation. Several furnaces continue occasionally to reserve some additional second half tonnage for regular customers, but they refrain from making additional sales, either because they already have as much business on their books as they desire, or they are waiting for prices to be established as of July 1 before adding to their bookings. Sales of prompt and nearby iron during the week were made up of a few small tonnages of off grades which could not be shipped on regular contracts. New inquiries continue to come out but they are not as numerous as in previous weeks owing to the fact that consumers are finding it useless to try to buy iron.

Inquiry Pouring In

Buffalo, April 30.—The same voracious demand for pig iron continues to exist and the same situation confronts it—no iron. Furnacemen here say that the inquiry for all kinds of pig iron is strong and incessant. It is pouring into this district and from consuming centers as far away as the Pacific coast. Every inquiry is treated in the same way;—it is turned down summarily. All the furnaces of the district are sold up for the balance of the year. The American Car & Foundry Co. is expected to enter the market shortly for large tonnages of malleable and charcoal covering government car orders, but it is said that this will stand little chance of being satisfied in this territory.

Furnace interests have been instructed that they must sell no iron except on government order. This, it is believed, may interfere also with certain iron that is being delivered now, and which was contracted for months ago. Furnacemen had been contending that they should be allowed to ship this iron, but the government promulgation apparently prohibits this. The furnaces of the district at the present time are working 80 to 85 per cent on government orders, so this will affect a relatively small trade. At the same time, some hardship may be brought about for the foundries or mills affected. The government demands will be enormous before very long, sellers say, and they further add that the situation is merely in its incipient stage.

Heavy Allocations in Sight

Cleveland, April 30.—Producers of iron are urging the government to adopt more formal and comprehensive methods whereby the increasing allocations for war purposes may be expedited. At present, these allocations are being made by the committee on pig iron, ore and lake transportation through deputized representatives on request. Some sort of an official procurement system may be worked out. A heavy tonnage of iron requirements for government purposes is in sight. Principal among this are the 400,000 to 600,000 tons of basic, foundry, malleable and charcoal grades to cover the war railroad car program since each car will require 3½ to 4 tons of castings. A leading New Jersey furnace interest, because of its near-tidewater location, will supply 20,000 tons of bessemer wanted by the procurement division of the war department for June-September shipment to France. Involved in this allocation was the providing of 20,000 tons of lake bessemer ore which will be used by the furnace in mixture with an equal amount of its own local ore. An Ohio river steel works with ordnance contracts which had tried unsuccessfully to buy basic is to be furnished 3000 tons of prompt iron by allocation. A Minneapolis foundry will receive 500 tons of high silicon high manganese iron from Virginia and wants 200 tons more; for the Mare Island navy yard, 400 tons of coke foundry has been taken by Pittsburgh and southern Ohio furnaces, 800 tons of copper free low phosphorus by a Milwaukee maker, and 400 tons of charcoal by Lake Superior interests. The Norfolk navy yard wants 500 tons of No. 1, 1000 tons of No. 2, 900 tons of No. 3 and 500 tons of charcoal, delivery half in 120 days and half in 140 days. There remains in the market a large amount of uncovered inquiry. New requests are considerable. The General Electric Co. still is endeavoring to place orders against its recent large inquiry.

Await Government Action

Chicago, April 29.—Principal interest now in the pig iron market is centered in the method to be determined in alloting pig iron to various users to obtain best results for the general situation. Although producers have booked tonnages in keeping with normal consumption by various users, it is felt that war demands and government work may cause the iron to be used in a varying proportion, and that the former plan will be disarranged. At present various tonnages are being awarded by the government and furnished on order ahead of contracts, thereby delaying deliveries on regular business. It is hoped that plans will be made to reduce contract tonnages proportionately as this especially ordered iron is delivered. No selling is being done from local stacks and such inquiry as is being received and turned down comes for the most part from outside sources or is for iron formerly bought in the south. Local melters are well cared for and are in no distress. Some selling of off iron is being done and it has been found that such iron with high silicon along with high sulphur can be used readily with No. 3 foundry iron to get a suitable result. Carlots of these irons have been disposed of recently without difficulty. In some cases melters have allowed these irons to be applied on regular contracts at a proportionate reduction in price. Close observers believe that careful distribution will result in sufficient iron being supplied for all uses through the remainder of the year and that no real famine will result, though efforts to accumulate stocks will have that effect.

Southern Movement Jumps

Cincinnati, April 29.—The movement of southern iron shows a wonderful improvement. The car supply, for some reason, has been better in the last few days than at any time for months. A result is the rapid forwarding of iron on contracts that was long overdue. Estimates differ as to the amount of iron piled in the south awaiting cars, but the tonnage is conceded to be close to 200,000. This iron is already sold and does not represent any metal that can be offered. Pig iron merchants are again talking of a foundry iron famine for the last half. It was thought that some southern furnaces would be able to sell a fair-sized tonnage for that

delivery, but later reports show that there will be little iron to spare and certainly not enough to go around.

Southern Shipments Heavier

St. Louis, April 27.—The movement of southern iron into this district has picked up materially during the past two weeks, due to an improvement in the car situation, but more directly to embargoes against other districts, which have resulted in diverting more tonnage to the St. Louis gateway. Several important consumers of foundry iron say it is their opinion Alabama furnaces will have a fair accumulation to dispose of during the last quarter. They base their belief on the intensive production and quiet admonitions from Washington to southern furnaces as to what is expected of them.

Still Selling Cautiously

Birmingham, Ala., April 30.—Inquiries for pig iron are numerous and southern makers are picking such orders as will accommodate regular customers and are in small lots for delivery during the last half of the year. Agencies of producers of this section are sending in many orders, advising acceptance and urging delivery. The business could not all be accepted, even if it were desired, as later some buyers whom the furnaces feel obligated to serve would be cut off. Furnace companies in this section could book business right now that would take up their whole probable make of the last half of the year. Shipments of iron from the south are better, the railroad car service showing improvement. Production is steadily gaining in Alabama, and if there is no unlooked-for setback, the record output will be realized during the coming month. Two furnaces will go into operation the end of this week or the first of next, which will add considerably to the aggregate production.

Low Phosphorus Sold Up

Philadelphia, April 30.—Spot pig iron sales are more numerous in this district, but in the total they have been relatively small. About 1000 tons of mostly foundry grades were closed in the week. Although unfilled requirements for both prompt and future delivery are large, new inquiries are less numerous. Consumers apparently know they cannot get the iron. A canvas of the low phosphorus situation by the American Iron and Steel institute shows that in counting the orders previously placed by the non-war consumers, 85 per cent of this has been sold for essential war purposes, leaving 15 per cent available for additional war requirements.

Plan Coke Plant for War

Government Looks for Site in Pittsburgh District for By-Product Works to Produce Explosives—Car Supply Irregular

Pittsburgh, April 30.—Engineers of the United States government are said to be making an investigation in this district with a view to selecting a site for a by-product coke plant to be built in order to get an increased supply of explosives including toluol and benzol. Details regarding the plans of the government have not been given out. The car supply in the Connellsville coke region continues to be irregular and is a source of more or less complaint by producers who are unable to adjust operations along a uniform line. Shipments going to furnaces are moving freely and while there are instances where some makers of iron find they are short of fuel, they are not common. The car supply on the Monongahela railroad yesterday was 100 per cent, today it was 70 per cent and for tomorrow 60 per cent is promised. Producers under their present operations can load about 75 per cent based on a 100 per cent car supply so that when an average over 75 per cent is furnished, cars are left over for the next day. The average on the Monongahela railroad last week was 58 per cent. Production during the week ended April 20 was 336,876 tons as compared with 334,291 tons for the preceding week, according to the *Connellsville Courier*.

New England Watches Washington

Boston, April 29.—Much interest centers in the coke situation and Washington is being closely watched by local consumers and brokers for some official announcement concerning the policy of the federal fuel administration. It is said that the New England Coal & Coke Co. is capable of a net production of 600,000 tons annually, while the New England foundry consumption is from 200,000 to 240,000 tons annually. There being considerable doubt whether there are ample transportation facilities to supply the coal necessary to insure this output. Contracts for a considerable amount of Connellsville coke have been booked in New England and word is waited from Washington as to whether these contracts will be allowed to stand.

Buy New England Fuel

New York, April 29.—If the fuel administrator adopts the order under consideration to prohibit the movement of coke into New England from outside producing districts, all New England consumers will be forced to depend for their requirements upon the New England Coal & Coke Co. It is considered in the trade that the proposed ruling undoubtedly will become effective shortly. As a result, a great many New England consumers, whose forward requirements still were open, have closed for large tonnages.

Production Is Problem

Cincinnati, April 29.—Production is now the serious problem. Occasionally there is a big improvement in the car supply, and this is heralded broadcast. This has caused a somewhat erroneous impression to get out that the shortage of both furnace and foundry coke has been relieved to any considerable extent.

Shipments Grow Slightly

St. Louis, April 27.—According to dealers shipments of coke from eastern ovens are a shade better, the average this week being about 60 per cent. The railroad situation has limbered up considerably. The number of loaded coke cars coming through during the past 10 days has been the largest in any like period since last fall.

Increased Output Needed

Birmingham, Ala., April 30.—Coke production in Alabama is about at maximum, but the unfilled demand remains strong. Rehabilitation of old ovens has been carried on for the past two years and very few units now are out of commission that could possibly be fixed up. According to well-informed coke men, 1000 tons daily more than is being produced could be sold. No time is being lost on the construction of new ovens throughout the district, particularly the big addition to the by-product coke oven plant of the Tennessee Coal, Iron & Railroad Co. at Fairfield. Recent revisions in coke prices by the government have had a most encouraging effect though several of the producers have contracts which will keep them from the market for at least 60 days. J. W. McQueen, president of the Sloss-Sheffield Steel & Iron Co. announces that arrangements have been made for a supply of coke to take the place of that being made now at Sayre where property has been leased.

Ruling Gratifies Dealers

Allowance of 3½ Per Cent on Scrap Sales by War Industries Board Expected to Clear Market of Uncertainty

FOR COMPLETE SCRAP PRICES SEE PAGE 1156

Philadelphia, April 30.—Scrap dealers in eastern territory are much gratified over the action of the war industries board in giving official status to their claims for a commission of 3½ per cent on sales. While the board, it is understood, has left the payment of the commission optional with the consumers, many of the latter have been favorably disposed toward this additional charge and it is expected that this tentative arrangement will not cause any complication. The general opinion is that the settlement of the commission matter clears the market of much of the uncertainty which recently has overhung it. For that reason it is believed that considerable revival of business will be stimulated. During the past week the market has continued in its drifting state.

Cast Demand Active

Boston, April 29.—Cast scrap is in good demand at firm prices by New England foundries, but the situation otherwise is quiet and without new feature. With the matter of commissions still in abeyance, there is not much inclination on the part of the trade to do much, while the lack of normal transportation facilities is restricting to a considerable extent the shipments to important consuming points outside of New England. Supplies in all lines are moderate and the market is firm, being held in bound only by the government limitations. There is no quotable market on cast iron car wheels for the reason that all that become available go directly to the makers under the provisions of the contracts for new wheels which call for an old wheel in exchange for every new one. The railroads are behind in their exchanges and naturally open market offerings do not amount to much.

Paid Commissions in Advance

New York, April 29.—Sellers of scrap report a good volume of business. While trading is not to be compared with that during the past year, buying is far above normal. The feature is the great scarcity of cast scrap. Dealers state that under no circumstances would they accept orders, unless they had this material actually on hand. Steel scrap, however, is becoming more plentiful, this being due in part to the increased activities of the shipyards. Prices remain comparatively steady, the only changes being in wrought pipe and No. 1 machinery cast. These descriptions are now holding at $29.50 to $30 and $31.75 to $32, respectively. Many buyers are paying dealers a 3½ per cent commission in anticipation of a later adjustment. Buyers in some cases also are accepting material on back contracts at prices prevailing prior to April 1, believing that a decision will be rendered in this matter favorable to the dealers.

Turnings Slightly Firmer

Pittsburgh, April 30.—The market for machine shop turnings, which has been quotable at $18, delivered, or $1 a ton under the government maximum, appears to be established at $18.50. A consumer in this district who has been paying the former price has closed for 500 tons at $18.50. Limited lots of heavy axle and forge turnings have been sold at $24, the government figure. Cast scrap desirable for the cupola is scarce but sales have been made at $31 to $33. Two sizable lots were bought by a consumer in this district at $32.50, or $1.50 under the government maximum. Heavy melting steel is firm at $29. Dealers say that stocks of consumers are low or entirely exhausted. Shell turnings are being offered rather freely. Some consumers are willing to take tonnages from dealers with the understanding that a commission is to be allowed in the event it is approved by the government, while others refuse to insert such a provision in their contracts.

Better Movement Interrupted

Buffalo, April 30.—The market continues strong for almost every grade of scrap material with no change in prices. The movement of material had been easier for a time, but this has been interrupted during the past week by the scarcity of gondola cars. The majority of these cars are being sent back to the mines empty instead of being diverted in large numbers to the scrap trade as formerly. The interest of the trade still is active in the matter of the cast scrap price. It is believed that the strong protests that have been made against the price of this material will bear fruit in the shape of a new level and a reduction some time before July 1, when the other schedules come up for revision. It is considered likely that malleable scrap will receive similar consideration, and that in the case of this, too, before July 1, a new price of possibly $5 less than the present will be made.

Detroit Under Embargo

Cleveland, April 30.—Outside of heavy melting steel, which is holding even with the $29 government maximum, scrap iron and steel prices in the Cleveland district are soft. No. 1 cast has little demand as the foundries are out of the market. No. 1 busheling also is finding few buyers. Borings and turnings are not showing any recovery. More fish plates, knuckles and couplers would change hands were they available. Contracting is not active because of general uncertainty. A Big Four railroad list, with a total of about 575 tons, closes May 4. A 12-day embargo has been imposed upon shipments of scrap in and out of Detroit. Rejections are being made more frequently than in the past few months.

Steel Active at Chicago

Chicago, April 30.—Except for activity in steel grades, the scrap iron and steel market is quiet and steady. Much of the present demand for steel scrap results from short sales for which dealers are seeking to obtain material in the absence of large supply. This is causing some competition in the market. The quotation is at the maximum, $29 per gross ton, which allows little opportunity for speculation. Quotations are steady and although most grades are selling at less than the maximum, they have not weakened perceptibly and in a few cases prices have advanced a shade. Scrap is not moving freely and comparatively little is coming out. The Rock Island and the Northwestern each has offered 3500 tons. In the former list 500 tons of steel rails, 700 tons of No. 1 wrought and 500 tons of No. 2 wrought were features, and in the latter list 500 tons of No. 1 wrought and 750 tons of steel rails were most noticeable. These tonnages are unusual and have not been equaled in railroad offerings for some time.

New Business Unimportant

Cincinnati, April 29.—A dealer very aptly describes conditions as warranting the display of crepe as far as new business is concerned. Transactions are of a minor character. Shipments to some consuming sections gave promise of improvement, but

the same old difficulties as to embargoes still are to be contended with. Although no highly skilled labor is required in a scrap yard the supply of workmen available is curtailed and has become more unreliable. No changes in prices have been made, but all quotations are not firm.

Buyers Are Holding Off

St. Louis, April 27.—The scrap market here continues dull and featureless. Both buyers and sellers are disposed to hold off, awaiting some decision in the matter of commissions. Deliveries on contract are coming along in fairly satisfactory shape, many delayed shipments having reached their destinations during the last two weeks. This fact has a further tendency to curtail new business. Generally there seems to be an abundance of scrap. Only a few grades are scarce, among them being steel car wheels and iron car axles, both of which are quoted at or close to the government maximum. The price tendency is downward, especially on materials for iron mill use. Stove manufacturers, who are beginning to feel keenly the scarcity of pig iron, have been quietly annexing old metal wherever they can pick it up at a bargain. One large plant on this side of the river purchased a heavy tonnage this week for the last half. Stocks with several important rolling mills are low. Fair shipments out of this district to eastern points were reported during the week, and May 1 will find contract deliveries closer to par than for many months.

Unsettled Condition in South

Birmingham, Ala., April 30.—The scrap market in the Birmingham district still is unsettled. The demand is light though stocks are diminishing gradually. The fact that nonessential industries are being asked to curtail operations to conserve on fuel and transportation demands is being felt by dealers. Cars are plentiful and dealers are able to ship all the scrap for which they have orders. Quotations show but little change. Consumers in home territory are not obliged to pay the maximum prices.

Handles Pipe Sales

L. P. Sutter has been appointed district sales manager in the Pittsburgh office of the Mark Mfg. Co., 538 Oliver building. Mr. Sutter, who has had charge of the Indiana, Ohio and Michigan territory of the company, with offices in Toledo, O., succeeds B. T. Bechtel, who has been made assistant general manager of sales with offices at the company's headquarters at Chicago.

British Want Shell Steel

Lack of Forging Capacity Causes Rounds to Pile Up on Mill Yards—Last Half Orders Unplaced

New York, May 1.—No further allotment of 4,030,000-ton shell steel order for the government and its allies which was referred to by THE IRON TRADE REVIEW, April 11, has been made. It is hinted that 1,200,000 tons of this order, previously distributed, is all the mills can handle for first half delivery on account of the limited forging capacity in this country. Part of the foregoing tonnage is already rolled but is waiting instructions from Washington as to where it is to be sent for forging. Makers do not expect to receive their second half allotments until later. However, the British are out after more tonnage for immediate delivery. Unless the government agrees to give them part of the 1,200,000-ton order, the mills will be unable to pay any attention to the British demand. At the same time the government allotted the 1,200,000 tons of shell bars it placed 300,000 tons for the British and when second-half allotments are made 350,000 additional tons is expected to be placed for the latter.

No Tonnages Available

Pittsburgh, April 30.—Insistent inquiries for billets and sheet bars are being answered by makers and sellers that they have no available tonnages whatever. Scarcity of semifinished steel is becoming increasingly acute and is causing considerable apprehension. The drain made upon producers by government demands has been and is enormous and the confining of output to tonnages for essential manufacturers is more marked that ever. Sheet mills are particularly urgent in their request for sheet bars. One maker of sheets is seeking 6000 tons. Among the inquiries for 4 x 4 billets is one for 3000 tons. Inquiries for slabs also are coming to producers from platemakers in the east. As an example of the sweeping demands of the government may be cited a case where a consumer had bought a considerable tonnage of ingots for the production of billets and sheet bars. When the buyer asked for shipment he was advised that the government had commandeered the raw steel for its own use.

Strip Market Quiet

Pittsburgh, April 30.—The market for cold-rolled strip steel is quiet. Production is proceeding at a good rate of capacity and owing to the improved supply of cars shipments are more satisfactory.

Better Inquiry

Shown in Cast Iron Pipe in East—Dullness Elsewhere

New York, April 29.—Bids on several good-sized tonnages of cast iron pipe are to be closed this week by eastern cities. The largest inquiry involves 2100 tons of 36-inch for Buffalo, bids to be closed May 1. Hartford, Conn., will close bids May 3 on 700 tons of 24 to 42-inch. On May 6, Lebanon, Pa., will also close on a smaller tonnage of 6-inch, about 5000 feet being required. A source of encouragement to sellers this week has been the decided improvement in miscellaneous private demand, inquiries involving several thousand tons now being before the market. Government demand also is a good volume.

Mills Heavily Booked

Pittsburgh, April 30.—Pipe mills are heavily booked, especially for lapweld sizes, and some are not taking any new business. Others examine inquiries carefully before taking tonnages. Sizable lots are being taken either directly or indirectly for the government.

West Buys No Pipe

Chicago, April 30.—Inquiry and selling of cast iron pipe is practically a thing of the past. Cities are not coming into the market and pipe shops are not busy, some being shut down. Foundries in connection with pipe shops are fairly busy on specials and on castings for machinery and shipbuilding purposes, these foundries being utilized to the full wherever their facilities allow. The United States Cast Iron Pipe & Foundry Co. has been awarded 1500 tons at Springfield, Ill., on which bids were opened a fortnight ago.

Southern Demands Small

Birmingham, Ala., April 30.—Orders for cast iron received by southern manufacturers are few and in small lots. The largest tonnage reported lately is for an explosives plant to be erected near Nashville, Tenn. Some few orders for pipe to be used by the government have been and are yet being filled.

Trade May Get Bar Steel

Government's Heavy Demands for Open-Hearth Material Leaves Some Bessemer for General Use—More Cancellations Made

Cleveland, April 30.—Further cancellations of a commercial tonnage in steel bars which long have been on makers' books and is not likely to be shipped under the increased restrictions on nonwar business have been made by some producers. While large producers are booking nothing but government orders, there are occasional gaps between the latter on mill schedules and these are being being filled in with commercial tonnage. The implement trade is getting some tonnage in this way. This practically is all of bessemer steel owing to the government's heavy demand for open-hearth metal. Shafting remains in considerable demand for various war purposes. A sale of 200 tons for range finders was made this week. Local manufacturers of nuts and bolts are having difficulty to get steel to fill their requirements and they may have to resort to the use of bar iron. Nut and boltmakers in this district have received their quotas of the large government orders recently placed.

Consider War Business Only

Pittsburgh, April 30.—Some makers of steel bars report that they are giving consideration to no business whatever except through the sanction of the government. Implement makers, however, will be given a good position on the books of makers, inasmuch as their machinery is necessary for the harvesting of crops. Inasmuch as the government tonnage chiefly is in open hearth some of the mills still are able to supply their own and other consumers with bessemer steel. Steel bars are said to have been placed in the third of three classifications arranged by the war industries board according to the priority of tonnages, which are to be rolled. Makers of iron bars are heavily committed and are taking no new business except that for the government.

Sell Only to Government

Chicago, April 30.—Under present heavy pressure for steel for government purposes, the largest interest and the leading independent in the Chicago district have ceased booking any tonnage for delivery at convenience of the mill. Some business of this kind has been taken during recent weeks to cover requirements of regular customers, but even this slight concession has now been stopped. The domestic user desiring steel for other than war purposes is now practically restricted to such tonnage as does not pass the rigid government inspection and can be shipped without delaying war preparation. Inquiry for hard steel bars on the part of manufacturers and reinforced concrete builders is increasing but until scarcity of rerolling rails is lessened, mills will be unable to take on further business. The state of Illinois is seeking 650 tons of reinforcing bars for the new penitentiary at Joliet. With the government car order placed, makers of bar iron expect an increase in their tonnages to cover requirements of car builders. It is believed that allotment of the entire 100,000 cars will furnish bar iron mills with sufficient to cover practically all their production for the remainder of the year. Current business is light and nothing is being done for last half delivery.

Big Bolt Order Pending

Chicago, April 30.—With a demand aggregating 129,000,000 nuts and bolts for the government, other inquiries are not likely to receive much attention, especially as mills are well filled already with general business. On the large inquiry just mentioned, about 25 per cent was desired for prompt shipment, from stock, and is understood to have been apportioned in the east as western boltmakers were too fully filled up to make immediate shipment. On the remainder it is understood no allocation has been made.

Hoop Tonnages Wanted

Pittsburgh, April 30.—Fair demand for tonnages of hoop steel continue to come to makers and limited lots have been booked. The market for bands is quiet.

Shafting Orders Placed

Pittsburgh, April 30.—Fair-sized orders of cold-rolled shafting for both small and large sizes are being placed. The tonnages are for the government exclusively and are placed by it either directly or indirectly. Shipments are promised in 60 to 90 days.

Deliveries More Prompt

Boston, April 29.—There has been no special change on conditions in the steel and iron jobbing trade. Fewer complaints concerning deliveries are heard. Buffalo steel mills have had much more success in getting their shipments through to New England than have the Pittsburgh mills. This is explained by the better railroad facilities out of Buffalo than from Pittsburgh, and the fact that there is very much less congestion on the New York Central lines than on the Pennsylvania. Business in domestic lines is flat. War plant needs constitute practically all of the current dealings at the warehouses.

Import Ban

On Ferro and Spiegel Arouses Protest—Corporation Buys Ore

New York, April 29.—Considerable dissatisfaction prevails over the import restriction announcement of April 22, which prohibits imports of ferromanganese and spiegeleisen, except overland by way of the Great Lakes from Canada, or overland from Mexico. Importers point out that no ferromanganese or spiegeleisen is coming to this country either from Canada or Mexico. Furthermore, they cannot understand the advantage to be gained, since there is plenty of vessel space for bringing these metals in from England, where all the supplies should have been obtained. Several of the leading importers of English ferromanganese have formally protested to the authorities at Washington. Demand for ferromanganese, while not as active as has been usual in recent weeks, still is brisk. Among current inquiries for 70 per cent ferromanganese is one for 1000 tons from the Youngstown Sheet & Tube Co. Numerous smaller inquiries are out. The market on ferromanganese appears firm at $250, delivered, for 70 per cent and $290, delivered, for 80 per cent, which is equivalent to a premium of $4 per unit for metal exceeding 70 per cent.

Some consumers who recently inquired for spiegeleisen on account of the scarcity of ferromanganese, have found the former is the more difficult of the two to obtain. Among current inquiries for spiegeleisen is one for 1000 tons of 18 to 22 per cent. The market on 16 per cent appears to be firm at $75, furnace, for spot metal, while second half is quoted at $70.

The market on 50 per cent ferrosilicon is devoid of activity. Current inquiry is for prompt and nearby carloads. These are held at all the way from $1.65 to $1.70, delivered. The contract market continues at $155, delivered.

Ferrotungsten apparently has recovered from recent irregularity. Seventy per cent metal is quoted at $2.20 to

$2.30 per pound of tungsten contained. Demand is fairly active. Spot ferrochrome continues to be quoted all the way from 40 to 50 cents per pound of chrome contained, for 60 to 70 per cent metal, containing 4 to 6 per cent carbon. The contract price is nominal at 31 to 35 cents.

Corporation Buys Manganese

New York, April 29.—The United States Steel Corp. will take manganese ore and concentrates from the Butte-Detroit Copper & Zinc Mining Co. at a minimum rate of 4000 tons monthly, or practically the entire output of the Butte-Detroit company, in accordance with a contract just signed. The contract covers a period to Aug. 1, 1919, at which time it may be renewed for one year. The present capacity of the mill at the Ophir mine of the Butte-Detroit company is insufficient to meet the Steel Corporation's requirements. Arrangements, therefore, have been made whereby the output of black manganese ore from the Ophir mine will be concentrated at Helena, Mont., by the New York & Montana Testing & Engineering Co. The pink manganese ore will be concentrated at the Ophir mill.

Inquiry is Light

Pittsburgh, April 30.—Inquiry for ferroalloys is quiet. Small lots of 70 per cent ferromanganese and 16 per cent spiegeleisen are being sought and sales are being made at $250, delivered, and $70, furnace, respectively, for prompt shipment. Makers report that there is a shortage of spiegeleisen. The market for 50 per cent ferrosilicon is not active. This alloy is quoted at $170 to $180, delivered, for spot shipment and $155 for the last half.

Nagle Buys Mill

Philadelphia, April 30.—The Nagle Steel Co. has bought the plate mill of the Glasgow, Pa., which it has been operating under lease since April, 1916. An option of purchase within three years after the lease now has been exercised. The purchase includes a 96-inch sheared plate mill, office building, testing room, etc. The puddling mill at Glasgow remains in the possession of the Glasgow Iron Co. The Nagle Steel Co. now owns three plate mills, including a 54-inch sheared unit at Pottstown and a 16-inch mill at Seyfert.

The Central Iron & Steel Co., Harrisburg, Pa., recently increased wages of its laborers, 15 per cent.

Reallocate Ship Tonnage

Plate Orders for Emergency Fleet Being Redistributed to Obtain Uniform Production and to Eliminate Useless Transportation

Pittsburgh, April 30.—With a view to remedying faulty distribution of tonnages, which has caused delays in building vessels, the war industries board has adopted a plan by which ship steel is being reallocated among the mills. It is understood that this policy has been put into effect at the direction of Charles M. Schwab, director general of Emergency Fleet operations. By readjusting orders for plates, shapes and bars, mills will be given certain portions of tonnages entering into the construction of ships, and other mills will be given other tonnages, so that when the two are put together and produced simultaneously, they will represent so many complete ships. Shipments to fabricators are to be made under a similar plan, so as to involve the least possible transportation of steel to them and from them to shipyards. It has been made clear that one great cause holding up the shipbuilding program has been the faulty distribution of steel among mills and of orders with fabricating plants, resulting in much unnecessary transportation and the waiting of steel for one part of a ship while that for another part already has been produced and fabricated. Men connected with the plate industry have signed readily the formal pledge by which makers promise prompt production and delivery in the largest possible quantity that the government may require for itself and for its allies.

Commercial Tonnage Passed

Cleveland, April 30.—It now has become practically impossible to place any orders for plates where the delivery is not made subject to class A priority orders. Certain makers stipulate that in taking commercial orders to be rolled at convenience they are noncancellable and are entered at present prices. Where some mills in the east particularly were able to offer tonnage chiefly in universals, this practice has ceased and these plants now are on practically a 100 per cent war basis. A new inquiry in this district calls for 500 tons for the shipping board for restoring lake vessels which are to be cut in two to pass the Welland canal. While the formal orders have not yet been placed, it is understood the bulk of the approximately 100,000 tons for the new Fleet corporation vessels to be built by the American Shipbuilding Co. will go to a Pittsburgh mill and a considerable portion to Chicago.

Western Production High

Chicago, April 30.—Greatest insistence is being placed on the production of steel plates for shipbuilding, and mills are straining every facility to add to their tonnage. Requirements for this line are increasing steadily as new shipyards come to the point where they can begin construction. Some difficulty is being experienced in obtaining sufficient fuel and cars, which is said to be reducing output about 15 per cent in some cases in the west. Mills continue working at utmost speed, as far as circumstances will allow. The leading interest has all its 66 open hearths active at its two plants. This condition has continued several weeks and it establishes a new record for steady operation.

Terne Sheets

In Big Tonnage Asked for Gas Containers—War Needs Heavy

Youngstown, O., May 1.—Inquiries came out to one of the mills here this past week from a branch of the ordnance department at Pittsburgh for 16,000 sheets of terne plate to be used for acid and gas containers. The valley mills, however, are not large producers of this material. On this account and because the particular mill was booked two months ahead with government orders, this inquiry was satisfied in another district. Tin plate mills are operating at 100 per cent capacity and are all on government work. Export inquiry is unusually brisk having increased the past month, but mills are in no position to take on any new business in view of government demands for food containers.

Car Supply Adequate

Pittsburgh, April 30.—Tin plate mills now are receiving an adequate supply of cars. Stocks in warehouses are being reduced steadily and before the end of the current week perhaps will be normal, or about one week's production of approximately 800,000 boxes. The output during the past week was continued at a good rate, although it was reduced under the average of recent weeks owing to interruptions caused by the temporary breakdown of machinery.

Export Sheets in Demand

Buyers Offer Attractive Premiums to No Avail—Mills Push Output of Painted Stock for Trench Use

Chicago, April 30.—Sheet mills are receiving and resisting a tremendous inquiry for steel sheets for export on which prospective buyers are willing to pay considerable premium over fixed prices on domestic contracts. Recent offerings have included 6c, Chicago mill, for No. 28 gage black sheet; 7.25c, Chicago mill, for No. 28 gage galvanized sheets, and 5c, Chicago mill, on No. 10 gage blue annealed. These prices are a substantial advance over the figures limiting sales in this country, but under the circumstances, mills are unable to participate in this business. The government is not taking many sheets, but the irony of the situation is that sheet mills cannot obtain sufficient steel in the form of sheet bars, the ingots being diverted to other purposes, in which the war needs are greater. An independent sheetmaker in this territory has production covered almost through third quarter.

Steel Shortage Cuts Output

Pittsburgh, April 30.—Demands made upon sheet mills by the government are extremely heavy, but producers are greatly handicapped owing to a shortage of sheet bars. Operations in this district probably do not exceed 50 per cent of capacity. Some mills still are down because of the lack of steel and considerable concern is felt that orders directly and indirectly placed for the government may not be filled on schedule time. Requirements for galvanized and corrugated sheets are especially large. Strictly domestic demands are light. The American Sheet & Tin Plate Co., soon will open its books for last half business.

War Demands Are Supreme

Youngstown, O., May 1.—Sheetmakers in this district did not have far to go when the government requested that other than government business be subordinated. Most mills have been rolling government tonnages almost entirely for some time and one mill in particular reported last week that its entire schedule was taken up with government work until the beginning of the third quarter. No large government orders have come out recently. The mills are still working on the government order for painted sheets which was placed about three weeks ago and was unusually large. These sheets are corrugated from stock 30 inches wide, machine painted, and are being forwarded to France where they are used for trench covers and billets. Recently the government found that the corrugations on some of these sheets would not match the corrugations on others. Some mills were corrugating from stock 29½ inches wide while others were corrugating from stock 30 inches wide. This was remedied by deciding on 30-inch widths which the government invariably specifies for corrugated sheets now.

War Takes Shape Tonnage

Only Occasional Lettings in East and West in General Market —Angles Placed for Wire Entanglements

New York, April 29.—The largest structural contract not identified with war requirements, to be let in the east in months, involves 4000 tons of steel for the Culver rapid transit extension, Brooklyn, which went during the past week to the Bethlehem Steel Bridge Corp. With this exception, all the work let or pending, is directly connected with our war program. Altogether, however, the current structural tonnage continues light. In plain shapes the market practically is dead and none of the mills have taken any orders exceeding 50 tons during the past week. Angles for posts for barbed wire entanglements for the American expeditionary forces in France, amounting to about 2400 tons, however, have been placed with a Chicago manufacturer. Bids are being taken for 4000 tons for the pier sheds for the proposed Boston terminal, as against 8000 tons in the original inquiry.

To Readjust Orders

Pittsburgh, April 30—Reallocation of ship steel tonnages among producers so as to expedite the building of vessels also will be applied to fabricating plants. By this arrangement steel will go to fabricators from the nearest mills and from the former to the nearest shipyards, wherever this adjustment can be worked out satisfactorily. By this means much useless transportation, a source of delay under past conditions, will be avoided. It is known that there are fabricators in this district who are getting ship steel from St. Louis despite the enormous tonnage of such material that is produced in the Pittsburgh district. Some of the latter in turn has been going past nearby and to distant fabricating shops and has to be doubled back over a long line of transportation to shipyards after being fabricated. Government orders placed with fabricators in this district during the past week are understood to have been light and the situation may have been due to the plan of reallocation which is being worked out.

Special Steel for Tanks

Cleveland, April 30.—Some special steel will be bought by the local plant which, as stated last week, has received a government order for 500 to 1000 tanks of the smaller type. This will be chiefly for gears, shafts, etc. Each of these tanks will weigh about 4 tons but the bulk of the steel will be of armor plate character and will be supplied direct by the government to the builder. Manufacturing buyers are placing some orders for plain material for stocks as an insurance against transportation troubles.

Shape Tonnage Larger

Chicago, April 30.—Although placing of contracts for structural shapes in the west has been at a minimum for a number of weeks an unusual spurt was taken within the past few days, resulting in somewhat less than 3000 tons being contracted. The largest tonnage is for an office building for the Peoria Life Insurance Co., at Peoria, Ill., involving 2164 tons, the contract for which has been taken by the Christopher & Simpson Iron Works Co., at St. Louis, Mo. Doubt is expressed by many whether the building will be erected for several months. Other tonnages are smaller. Demand on structural mills for shapes to go into shipbuilding continues unabated and absorbs most of the available output.

CONTRACTS AWARDED

Sheet mill extension for Newport Rolling Mill Co., Newport, Ky., 700 tons, to McClintic-Marshall Co.

Extension to plant of Apollo Steel Co., Apollo, Pa., 150 tons, to McClintic-Marshall Company.

Office building for the Peoria Life Insur

ance Co., Peoria, Ill., 2164 tons, to the Christopher & Simpson Iron Works Co.

Substructure for North Michigan avenue bridge, Chicago, (Rush street bridge), for the Great Lakes Dredge & Dock Co., 352 tons, to the Bethlehem Steel Co.

Icing shed and trucking bridge, for Armour & Co., South Omaha, Nebr., 240 tons, to Omaha Structural Steel Co.

Bridge for Lehigh & New England railroad, 170 tons to an independent fabricator.

Marine railroad for government at Charleston, S. C., 350 tons to Boston Bridge Works.

Plate shop, New York Shipbuilding Corp., Camden, N. J., 300 tons to an independent fabricator.

Crane runway, Wm. Cramp & Son Ship & Engine Bldg. Co., Philadelphia, 1000 tons to an independent fabricator.

CONTRACTS PENDING

Piersheds for government terminal at Boston, 4000 tons, bids being taken.

Bridges for Pennsylvania railroad, 300 tons. Bids being taken.

Mills Cautious

In Selling Wire Products Because of Government Demands

Pittsburgh, April 30.—Makers of wire and wire products are cautious about taking new business. None will commit themselves for large tonnages for commercial use and others will not take any bookings unless the material is for government use. Some makers are canvassing stocks that consumers have on hand and if they consider they already are supplied sufficiently will not take additional business from them. The point has been reached where even an inquiry for a carlot of nails is carefully scrutinized before the business is booked, and no commitments beyond July are being made by some mills Operations have increased and some makers report that production is proceeding at a good rate of capacity. Others are running at only 40 per cent. The government is taking large quantities of nails for shipment to France. Cancellation of the order for 50,000 tons of barbed wire for France releases capacity for the production of requirements from other sources, including 60,000 tons of this kind of wire for Italy.

Italian Order Not Held Up

New York, April 29.—Instructions to hold up work on barbed wire orders which were allocated on April 19, refer, it is learned, only to 50,000 tons of this product originally scheduled for shipment over the next four months to France. Work on the filling of orders for the remaining 60,000 tons will be prosecuted in accordance with the original orders, which specify delivery to Italy over the next six months. The orders for the barbed wire for shipment to France are understood to be held up only temporarily.

Government Cars Awarded

American Car & Foundry Co. Receives 30,000—Unofficial Distribution of Remainder—1025 Locomotives Are Placed

New York, April 29.—With the award of 30,000 cars to the American Car & Foundry Co. this week, the government's vast program for the purchase of railroad equipment has at last been gotten under way. The remainder of the order has been divided among the Pressed Steel Car Co., the Standard Steel Car Co., the Pullman Car Co., Haskell & Barker Car Co., the Cambria Steel Co., the Mt. Vernon Car Mfg. Co., and other builders. It is reported that the Canadian Car & Foundry Co. will receive a considerable number.

The order to the American Car & Foundry Co. called for steel underframe box cars and coal cars, and involved about $80,000,000. This price, it is said, represents a profit to the builder of approximately 5 per cent. The cars are to be completed in time for the heavy fall and winter traffic. Work will be allotted by the American Car & Foundry Co. to its various plants in Indiana, Illinois, Michigan, Missouri, Pennsylvania and Tennessee. Upon being completed the cars will be distributed among the railroads needing them most.

With the exception of government business, car buying during the past month has been light. It is estimated that not more than 3000 cars have been placed by private companies. Included in business recently placed are 100 tank cars to Pennsylvania Tank Car Co. for Swift & Co., Chicago, and 10 hoppers to the American Car & Foundry Co. for the Illinois Zinc Co. The Newburgh & South Shore railroad is asking prices on 100 gondola bodies.

The government also has made a start in placing its large locomotive orders. It has divided 1025 between the American Locomotive Co. and the Baldwin Locomotive Works, at a price of a little less than $60,000 each. The profit to the builders is between 5 and 6 per cent of the manufacturing cost. Deliveries are to begin in July. Most of the new motive power, it is understood, will be assigned to eastern roads.

Awaiting Rail Orders

Pittsburgh, April 30.—Now that the government has worked out its carbuilding program, makers of rails and track equipment are waiting tonnages it is expected to place with them soon. Producers are well booked, some of them as far ahead as the first half of 1919, and are taking no new business. They do not know what, if any, readjustment they may be called upon to make in their rolling schedules by the government or what the latter's requirements will be. It is believed that both bessemer and open-hearth rails will be called, the grades being divided so as to conserve the latter steel. It is not improbable that other branches of output will have to be curtailed in order to take care of the government orders. Railroads are buying small lots of standard spikes, deliveries being made in six to eight weeks. Some makers now are unable to take any more of this business. Producers also are filled up with orders for small spikes. Small tonnages of light rails are being sold but makers are no longer soliciting business.

Car Order Finally Placed

Chicago, April 30.—Announcement of the government car order involving 100,000 cars has taken one large element of doubt from the market. It is announced that the American Car & Foundry Co. has been allotted 30,000 cars, the Standard Steel Car Co. and the Pressed Steel Car Co., 13,500 each, the Haskell & Barker Car Co. and the Pullman Co. 7500 each, the Cambria Steel Co., the Ralston Car Co. and the Mt. Vernon Car Co., 3000 each, and the smaller companies a total of 19,000 cars. It is believed each car will require about 10 tons of steel in some form, although the effort has been made to reduce steel requirements as far as possible. This will mean 1,000,000 tons of steel during the progress of the carbuilding program, and many steel men wonder how it will be possible to get out this material without interfering with the shipbuilding program.

Award New Furnace

Pittsburgh, May 1.—Edmund W. Mudge & Co., Frick building, Pittsburgh, basic and bessemer pig iron merchants, who own and operate Claire Furnace Co., Sharpsville, Pa., and the Ella Furnace Co., West Middlesex, Pa., have closed contracts for a modern merchant blast furnace with a daily capacity of 600 tons, to be located at Weirton, W. Va. Contracts call for the completion of furnace shortly after the first of next year.

Government Drives Hard Bargain

Director Williams of Railroad Purchases Charged With Disregarding Main Vital Considerations to Make Dollars and Cents Showing in Car Purchases—Profit Limited to 5 Per Cent—Locomotive Builders Tire of Haggling

WASHINGTON, April 30.—If the action of the railroad administration last week in awarding contracts for freight cars is to be taken as a criterion, then the iron and steel industry may well join the railroad equipment builders and the railroads themselves in the opinion freely expressed here that the administration is becoming the most penurious of the nation's war organizations. This opinion particularly is held of the division of purchases and is backed by the general belief that the administration is taking advantage of the car builders' lean order books and will force them to come to its own terms. This latter phase draws strength from the fact that only approximately 5 per cent on manufacturing costs is to be allowed to the car manufacturers.

This 5 per cent profit is to be figured on the estimated combined cost of labor, material and overhead. In case the actual cost exceeds the estimated cost, the builders must pay the excess cost out of their 5 per cent profit. If actual costs are less than the estimated cost, the builders must divide such gain with the government. Under the arrangement, the government will supply the materials. The builders originally asked 10 per cent profit. They point out that if the next several months brings an unexpected increase in wages or overhead, increased cost may absorb part or all of their profits.

No less important than these developments, which follow the haggling over the prices extending over more than a month after bids were received, is one report that before deliveries of the 100,000 freight cars are completed, contracts for an additional 100,000 will be distributed. It is a well-known fact that 100,000 freight cars will not keep the railroads properly equipped.

Profits Are Cut Low

Information concerning the award of the first lot of 30,000 cars is very meager. The administration announced that the contracts had been given the American Car & Foundry Co., that "the amount involved was between $80,000,000 and $90,000,000, that the profit to the manufacturer is to approximate '5 per cent on the manufacturer's cost', that deliveries, it is hoped, will be made' in time for the fall and winter business of the railroads," and that "negotiations for the construction of 70,000 additional freight cars are still pending."

The statement indicates that the prices paid for the cars, which are to be "steel underframe box and coal cars of standard modern type and heavy capacity," range from $2500 to $3000 apiece, that deliveries are to begin in October and be completed from the middle of December and that the purchasing division is trying to get the carbuilders to cut their profits to a 5 per cent parity. The administration, being practically the only market for cars, realizes this and will fight for the last penny, according to opinions. The report concerning the withdrawing of the locomotive bids gives rise to the belief the engine builders are tired of the haggling and are actually trying to get the administration to take over their plants.

In addition to this, there is another rumor that John Skelton Williams, director of purchases, and on whom most of the blame is being placed for the dilatory and dribbling letting of contracts, has urged the car and locomotive manufacturers to get rid of their sales forces and to reduce the salaries of their "high-priced executives". The belief is that the administration is trying to show results in dollars and cents, forgetting that the very purpose in its inauguration by the President is to help win the war. That the administration has forgotten this may be seen in its attempts to win a lower price for the locomotive coal and to get equal priority with the shipping board for steel. In each of these attempts, however, the railroad administration was the loser when the questions were brought to a final decision.

Whatever may be the object of the railroad administration, carbuilders point out that Mr. Williams, in his way of handling the equipment purchase, is defeating the administration's own plans. It is certain he is embarrassing not only the car manufacturers, but the steel industry as well. In addition to delaying the ordering of such steel as other war requirements will allow, the dribble system of the allocation is hardly expected to keep pace with the deterioration raito the railroads and carbuilders employ in computing their requirements. The 30,000-car order represents between 1 and 2 per cent of the present freight car requirement of the railroads. Deterioration is figured at approximately 5 per cent annually. Nearly four months of government control has passed and the deterioration losses in that period have not been offset.

Pledge Government Full Mill Output

QUICK action has been taken by the government in lining up the steel plants of the country to furnish a 100 per cent output for direct and indirect war needs if such a demand for essential tonnage shall prove imperative. This is in harmony with the sweeping new policies relating to iron and steel supplies which the war industries board has framed to meet the tremendous requirements for war purposes now at hand or in sight. These policies which represent a new development of great importance both in the relations of the government and the iron and steel industry and in their effect on commercial trade in iron and steel were fully outlined in last week's IRON TRADE REVIEW.

Steel manufacturers now have pledged their best and most patriotic efforts toward securing maximum production and toward subordinating all commercial business to the governments requirements. This action was taken at a meeting of representatives of about 50 of the principal steel manufacturers of the country at New York, April 26, which was called at the request of J. L. Replogle, director of steel supply, to discuss the situation and to devise the methods by

which it might be met. Mr. Replogle made a strong statement of the immediate and future requirements of the government for steel in various forms for its military necessities, stating that these are so great as to demand the entire output of the industry in almost all lines. The pledge that 100 per cent of capacity will be devoted to government needs if necessary then was freely given by the manufacturers. It has been estimated that at present about 70 per cent of the country's output of iron and steel has been going direct to agencies of the government or to consumers designated by the latter. The meeting drew up a formal pledge covering prompt production and deliveries. This every member of the American Iron and Steel institute has been asked to sign and place on record as signifying his entire sympathy and cooperation with the movement to insure the government whatever it requires in the minimum length of time.

In sending this blank to members of the institute, President E. H. Gary said: "It is my belief that every member of the American Iron and Steel institute will be in entire sympathy with this action and will wish to be recorded as favoring it for himself and his company. To this end there are enclosed herewith two copies of the pledge as adopted. If it is your desire to be recorded with other manufacturers, please sign one copy and return it promptly to James T. McCleary, secretary of the American Iron and Steel institute, 61 Broadway, New York, retaining one copy for your files. It is hoped that all corporations will pledge themselves, and that in such cases the signature will be by the chief executive officer. I confidently hope that I may within a short time be able to advise Mr. Replogle that every member of the institute has signed this pledge."

Prepare for Future Demands

Judge Gary following the meeting in New York gave out a public statement of the purposes and results of the latter. He said: "The meeting was for the purpose of increasing the output of steel and iron and most of the country's manufacturers were present or represented. The situation in respect to the steel supply is not serious, but we decided to take measures to insure an output adequate to meet future demands of the United States government and the allied nations."

The agreement reached at the New York meeting marks the fulfillment of efforts begun by Mr. Replogle several weeks ago when in response to his requests, a number of steelmakers promised to hold in abeyance all other orders while they devoted 100 per cent of their production to government requirements.

Commercial Tonnage Will Be Cut Very Low

Philadelphia, April 30.—Indications are that eastern iron and steelmakers either have signed or will sign the general pledge to give maximum production to the government. The expected effect is that commercial consumption will be even more restricted than in past weeks; in fact, it is expected that not exceeding 10 to 15 per cent of the entire steel production will be available for commercial purposes. These figures are based on the fact that in recent weeks from 85 to 90 per cent of the average production has been going to the government.

The 100 Per Cent Pledge

April 26, 1918.

FOR myself, my corporation or my firm, I pledge the prompt production and delivery of the largest possible quantity of material in our departments that is or shall be required by the United States government for the necessities of itself and its allies, and agree that all other lines of our business shall be subordinated to this pledge, and all this in accordance with the request of the war industries board. (Signed.)

Under the pledge all steelmakers are taking only orders accompanied by priority certificates or orders they know are entitled to priority. Where any doubt exists, the consumers are being referred to Washington.

Expect War Needs Will Not Take Full Output

Youngstown, O., May 1.—All iron and steel manufacturers in this district heartily approve of J. Leonard Replogle's appeal to furnish the government and its allies with every pound of material possible. Pledge letters to this effect which were sent out by President E. H. Gary of the American Iron and Steel institute have been signed by valley makers and in many cases returned. A majority of the mills here have been almost entirely on government work either directly or indirectly for the past two months and the request, that from this time forward 100 per cent of the country's production be placed at the government's disposal, came as no surprise.

Sales managers are assorting their orders and wherever the orders call for material needed for war purposes, they are set aside and the rolling space allotted to the government. This, however, does not mean that the domestic trade will be ignored. While the mills have agreed to operate on government work at 100 per cent, there will probably be times when shipments of war materials will only average 75 per cent.

For the week ending April 27, coke ovens in the Mahonings and Greater Pittsburgh districts, were operating at 95 per cent, an increase of 3 per cent over the previous week; blast furnaces at 92 per cent compared with 91 per cent; open hearths at 90 per cent, the same as last week; and bessemer plants at 89.4 per cent, an increase of 4.4 per cent. Approximately 4050 tons of steel were piled on account of scarcity of cars. During the past week this amount was reduced to 600 tons. Embargoes are holding up 9539 tons.

Puddlers Given Increase

At the regular bimonthly wage settlement at Youngstown, April 30, it was developed that the average sales price on bar iron in March and April was $3.30 per 100 pounds. For January and February the price averaged $3.10. In March and April of 1917 it was $2.45 against $1.60 in 1916. By this settlement puddlers are advanced from $15.05 to $16.05 per ton and finishers are increased 10 per cent. The comparative bimonthly bar iron average price per pound and the resultant puddling rate are as follows:

	1917		1918	
Jan.-Feb.	2.35c	$11.30	3.10c	$15.05
Mar.-Apr.	2.45c	11.80	3.30c	16.05
May-June	2.65c	12.80	.....	.....
July-Aug.	2.75c	13.30	.....	.....
Sept.-Oct.	2.85c	13.80	.....	.....
Nov.-Dec.	2.95c	14.30	.....	.....

Charter Machinery Firm

The firm of J. J. McCabe, 149 Broadway, New York City, has been reincorporated under the name of the J. J. McCabe Lathe & Machinery Corp. No change, however, will be made in the personnel of the officers or in the future policies of the company. The action was taken that the firm could better meet the demands of present day methods in buying and selling new and used machinery. The officers of the company are: President, J. J. McCabe; vice president, H. P. McCabe; treasurer, J. J. McCabe Jr., and secretary, P. F. Sheeran.

Liberal Earnings

Shown by Steel Corporation in Initial Quarter of 1918

As developed at a meeting of the board of directors of the United States Steel Corp., April 30, earnings for the first quarter, 1918, decreased only $2,762,701 from the preceding quarter. The March earnings were impressive. After deducting expenses of operation, taxes, etc., $56,961,424 was earned in the three months ended March 31. This is on the basis of $7.21 per share of common stock, as against $18 a share in the corresponding quarter of 1917. In the latter case, no deductions were made for federal taxes, while in 1918, $31,585,198 was allowed for such levy. Comparative monthly earnings for initial quarters follow:

	1918	1917
January	$13,176,237	$36,074,425
February	17,313,883	33,416,171
March	26,471,304	43,630,422
Total	$56,961,424	$113,121,018
Dep. and sink'g fund	8,511,607	9,790,824
Net income	$48,449,817	$103,330,194
Bond interest	$5,509,540	$5,585,438
Balance	$42,940,277	$97,744,756
Dividends	27,907,775	27,907,775
Surp. for quarter	$15,032,502	$69,836,981
Federal taxes	$31,585,198	.....

Rail Bar Mills

Form New Association and Division Holds Pittsburgh Meeting

Pittsburgh, April 30.—Thh light rail division of the Rail Steel Products association met in Pittsburgh April 25 and discussed matters and policies affecting itself and the industries it represents together with their relation to government price-fixing and regulation. Edward E. Hughes of the Franklin Steel Works, Franklin, Pa., president of the Rail Steel Products association, attended the meeting.

This organization was formerly known as the Rail Steel Bar Manufacturers association. At a recent meeting in New York City, it was enlarged, the scope of its work extended and the name changed. At this meeting Mr. Hughes was elected president and A. S. Hook of the Calumet Steel Co., Chicago, secretary and treasurer. The association went on record at its New York meeting as being in favor of the payment of a commission to scrap dealers and brokers. Its three branches includes companies making small rails, 50 pounds and under; steel pipe; general shapes, reinforcing bars, agricultural implement, shapes and bars, etc.

The association consists of the following companies: United States Rail Co., Cumberland, Md.; West Virginia Rail Co., Huntington, W. Va.; Buckeye Rolling Mill Co., Steubenville, O.; Franklin Steel Co., Franklin, Pa.; Buffalo Steel Co., Tonawanda, N. Y.; Calumet Steel Co., Chicago; Eckles-Nye Steel Co., Syracuse, N. Y.; Elyria Iron & Steel Co., Elyria, O.; Interstate Iron & Steel Co., Chicago; Laclede Steel Co., St. Louis, Mo.; Republic Iron & Steel Co., Chicago; Sweet's Steel Co., Williamsport, Pa.; Witherow Steel Co., Pittsburgh, Pa.; Wisconsin Steel Co., Chicago; Danville Structural Tubing Co., Danville, Pa.; Inland Steel Co., Chicago, and Simmons Co., Kenosha, Wis.

Defer Institute Meeting

The fourteenth general meeting of the American Iron and Steel institute which was originally scheduled to be held at the Waldorf-Astoria at New York, May 24 and 25, has been postponed one week to May 31. This action has been taken on account of the Red Cross drive.

Scrap Commission

Is Allowed to Dealers by the War Industries Board

Washington, April 29.—Scrap dealers have established their claim to a commission of 3½ per cent on sales before the war industries board. This is in accordance with letters which were sent today to Chairman E. H. Gary of the general committee of steel and steel products of the American Iron and Steel institute, to W. Vernon Phillips, chairman of the subcommittee of the scrap iron and steel and to others before whom the question has been for the past two months. It is understood the ruling of the war industries board makes the payment of the commission optional with the buyers and it becomes effective immediately.

The Non-Ferrous Metals

Copper Lead Spelter Tin

	*Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	**Aluminum	Spot antimony
April 24	23.50	.....	6.80	6.62½	32.00	12.25
April 25	23.50	.....	6.80	6.62½	32.00	12.25
April 26	23.50	.....	6.70	6.62½	32.00	12.50
April 29	23.50	.....	6.60	6.62½	32.00	13.00
April 30	23.50	.....	6.60	6.62½	32.00	13.00

*Government fixed maximum price for prime lake, electrolytic and casting copper, in ingots, pigs, slabs, etc., less than carloads, 24.67½c.
†No spot Straits tin offering.
‡Outside market, prompt shipment.
**Government fixed price for 98 to 99 per cent ingot aluminum in 50-ton lots; lots 15 to 50 tons, 32.10c; one to 15 tons, 32.20c.

New York, April 30.—Interest was revived in the antimony market last week when the war industries board sent out a letter to various importers and holders of antimony, asking bids on 1000 tons, for May-June delivery. Prices accordingly rose from about 12.25c to around 13c, duty paid, exwarehouse, New York. ...

The war department is reported to have purchased about 9000 tons of grade A spelter in the past week, from various producers. The army specifications are somewhat lower than the navy department's, the former specifying 99.50 minimum zinc content, and the latter 99.85 per cent. The market for prime western spelter is extremely dull, largely because of lack of demand from galvanizers. Prices of this metal are considerably below cost, prompt, May and June shipment being obtainable at around 6.62½c. Arrangement has been made between producers of high grade ore and consumers for co-operation in handling ore at a higher price.

The tin situation is unchanged. The tin division of the war industries board has held several meetings with consumers in an effort to reduce consumption. It has also begun a campaign among consumers of tin plate in containers for paint and other commodities aside from food. Shipments of Banca tin from the Dutch East Indies still are being held up, which is of serious consequence since about 16,000 tons or around one-fourth of our imports last year were Dutch tin. There is no spot tin of any grade for sale and only Chinese tin apparently now can be purchased for future shipment from the Far East. The market on this grade is about 94.50c, c. i. f. New York, for May shipment, 95c for April shipment now afloat.

The outside lead market is quiet and unchanged. Outside sellers are quoting around 6.60c to 6.70c, while the American Smelting & Refining Co. is quoting 7c, New York. The trade is looking for another reduction by the leading interest. Inquiry is light.

Practically all of the aluminum output now is being taken by the government, at the fixed price of 32c for 98 to 99 per cent, in 50-ton lots. The price of sheets is 40c, base.

Representatives of leading copper producers meet in Washington on May 1, to take up the question of price fixing for the period beginning June 1, when the present agreement expires. Producers are selling June at 23.50c, the government maximum, subject to government price revision. Less than carload lots are obtainable at 23.50c plus a 5 per cent commission for handling, making this price 24.67½c.

Systematizing Parts Manufacture

Plant of Torbensen Axle Co. Displays Many Original Adaptations of Standard Productive Methods to the Making of Axles for Motor Trucks—Shop Operations Conducted With Great Efficiency

BY HOWARD MARKT

TO organize a new company, design and build a highly specialized plant and establish a broad international market for a single product all in the period of two years is a notable achievement even in this day of intensive industrial development. The methods, studies and ingenuity which have brought about this accomplishment tell an interesting story of initiative and enterprise. That it has been made possible, largely is due to the factor of originality which has characterized the co-ordination of manufacturing departments and to an unusual refinement of mechanical processes.

The principle underlying the physical and operating perfection of the plant of the Torbensen Axle Co., Cleveland, is high grade, quantity production of a single article representing the materialization of a novel idea. That idea is the internal-gear axle for automobile trucks. The Torbensen plant has been expanded so rapidly that at present it is capable of turning out 150 rear and 100 front truck axles daily. Five different types of front axles and an equal number of rear axles of capacities varying from ¾ to 5 tons now are being produced. Quality steel requirements of the plant including chrome-vanadium and chrome-nickel metal have been increased to approximately 10 tons daily. The malleable castings used total from 7 to 8 tons daily.

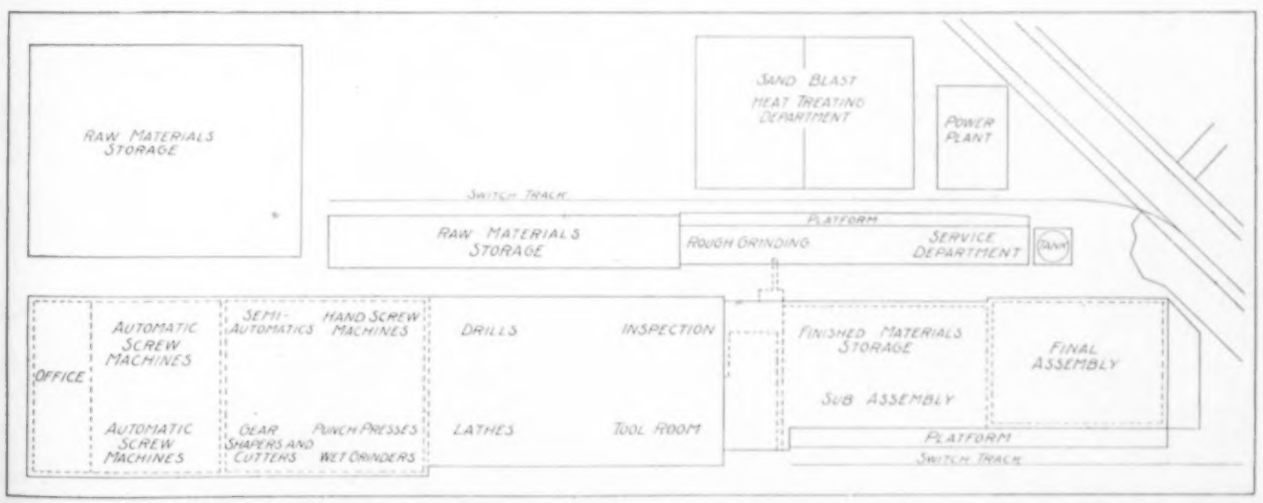
In the development of the plant careful attention has been given to the adoption of methods of greatest efficiency applicable to the special line of manufacture. To this end modern industrial and efficiency systems have been studied and sifted; and only the most modern and effective methods have been retained. The shop especially reflects the unusual care exercised in laying out the entire plant. It is at once apparent that much importance has been attached to the grouping and balancing of machinery and to the expeditious handling of raw materials and finished products. The human side also has not been lost sight of. Time studies are made so that rates for piece workers are fairly and accurately determined. The industrial workmen are carefully studied and their contentment promoted through the medium of the company's welfare activities. A noteworthy feature of the plant is that the same thoroughness that marks the production operations, applies to the efforts of the company to understand and assist its employes.

Many Steps In Manufacture

The product upon which this organization has been built is a truck axle of an unusual type. In this axle, an I-beam carries the load. By means of the usual differential gears, two jackshafts, two pinions and two internal gears, the driving force is transmitted to the wheels. In the production of these and other parts of the axle many interesting manufacturing processes have been evolved. Automatic, or semiautomatic screw machinery, mainly, is used in the initial operations. Succeeding work, depending upon the part, include gear cutting, splining and milling, thread cutting, lathe work, heat treatment, grinding, subassembly, and final assembly and testing. In the determination of the machine tool requirements as well as the grouping of shop equipment, the extent and character of the machining of the individual parts was the deciding factor. To accomplish this, a detailed study of the necessary machine work was made in order to properly correlate and balance the equipment.

The plant has been so designed that any increase of output necessarily requires a proportionately larger number of machines in direct ratio to the particular group. In the event that it would be desired to double the output, twice the number of machine tools in each group would be required. Normally the plant is operated only eight hours daily. Should occasion demand, however, a second shift could be utilized to double production without any increase in machinery. Under existing conditions, the capacity of the machinery is sufficient to enable the shop to meet production requirements on the basis of an eight-hour day.

Since the company has for its object the manufacture of a single product, those problems affecting a shop performing many varieties of work are obviated and a highly specialized arrangement of machines made possible. One of the most interesting examples of an original and effective solution of



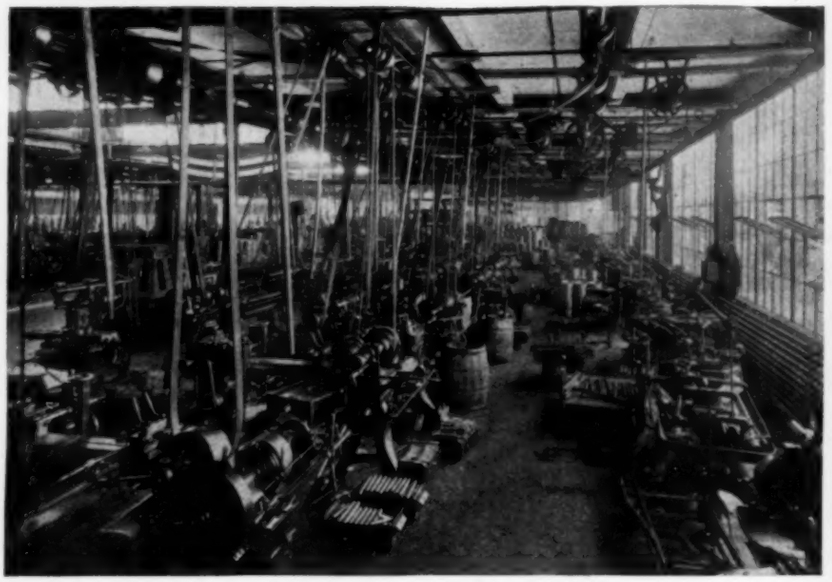
PLANT LAYOUT SHOWING ARRANGEMENT OF BUILDINGS AND THE LOCATION OF MACHINE TOOL UNITS

a shop problem is in an oiling system designed for the use of the automatic and semiautomatic screw machine, gears shaper and cutter, milling machine and drilling machine groups. The use of individual pumps on machines of these types long has been a source of inconvenience and loss, not alone in the wastage incurred, but also in time lost in making repairs and adjustments on the pumps. To obviate these disadvantages, a central distributing system has been installed. This consists of four tanks connected to form two separate systems; one for each machine tool section. Two of these are elevated about 15 feet and two are located beneath the floor level of the shop. Oil is supplied to one machine tool group through gravity from a line connected to one of the elevated tanks. After the oil has been used, it flows by gravity through a return line to the pump. Here it is strained and pumped again into the upper tank. The value of the system is indicated by the fact that in oil reclaimed and time saved, the installation has more than paid for its initial cost.

GROUP OF AUTOMATIC SCREW MACHINES ROUGH TURNING INTERNAL GEARS

Economies have been effected wherever feasible; that is where the cost of installing reclaiming measures has been subordinate to the item of loss. One of the interesting instances of this is in the means taken to collect turnings, borings and scrap derived from all sources. Many shops pay little attention to the subject of waste materials with the consequence that all kinds of scrap are thrown together. In the Torbensen plant efforts are made to differentiate between the chrome-vanadium steel, chrome-nickel steel and malleable scrap. Separate boxes and bins are provided and workmen are instructed to keep the scrap separated. Boxes within easy reach and a systematic method of collection has been found to effectively reduce any negligence of the men in complying with this rule. Where a company is engaged in daily machining large quantities of alloy steel, it is apparent the item of waste materials is large and the differences in market values of grades are considerable.

In the Torbensen plant, inter-machine transportation is done mainly by electric trucks. Raw material as well as semifinished products are loaded on small platforms. Through the medium of a lifting device on the trucks; these platforms are raised from the floor and carried to the spot wherever they are needed. Small hand trucks are used as supplementary carriers. This system necessitates the stacking of parts on platforms and tends to eliminate any littering of the floor with materials in process of finishing. One of the advantages of this system is the greater working space obtained for machine operators. This is an important factor in a plant in which almost every inch of floor space is designed to be utilized.



HAND SCREW MACHINES TURN THE SPINDLES AND BRAKE CAMSHAFTS

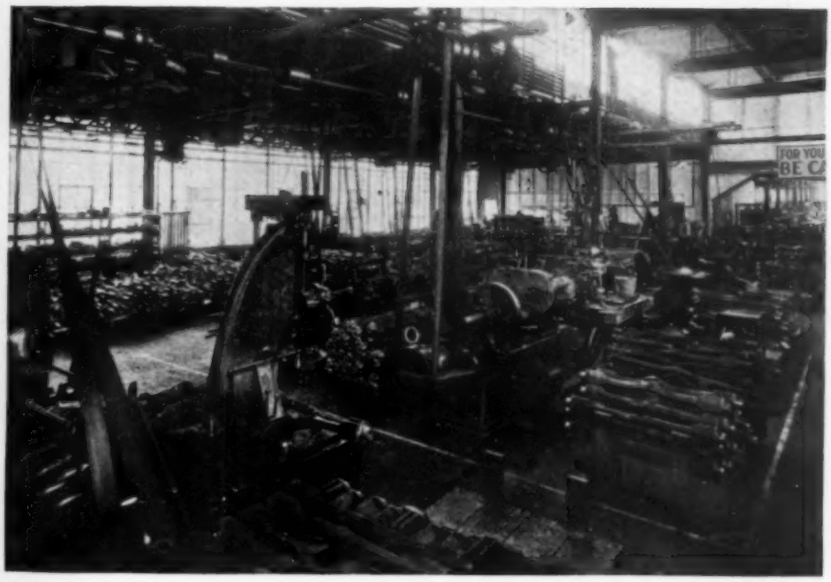
In their arrangement, the building units have been designed and arranged with a view toward plant expansion. The main building is approximately 700 feet in length and has an area of more than three acres. It is of steel mill construction and one story high. Adjacent to the main structure is a 2-story structure, about 300 x 375 feet. The first floor of this building is utilized for raw materials storage; the second floor is being equipped with machinery preliminary to the beginning by the company of the production of 3½-ton axles on a large scale. Eventually it is planned to devote the entire second floor of this building to the production of 3½-ton axles. A building 28 x 190 feet located in the rear of the raw materials storage, also is used for stocking raw materials. Adjoining this structure is a temporary housing for rough grinding of all kinds. The sand blast and heat treating departments are located in a similar structure 60 x 85 feet in size and are nearby. Toward the rear of the property is the boiler house. At the present time this is used only as a heating plant. Fuel oil for the heat treating department is kept in an 11,000-gallon tank near the boiler house. Additions contemplated involve a 5-story, 74 x 245-foot combined office building and gear cutting department and an extension to the raw materials storage structure.

The manner in which plant details have been worked out to a fine degree, is shown by a tunnel installation which extends the entire length of the main shop and the other buildings. A centralization of all fuel oil, air, water,

steam and gas lines has been made possible by running these conduits in the tunnel. The use of a centralized conduit system of this kind renders the inspection of the lines comparatively easy and enables repairs to be made promptly without materially interfering with plant operation.

Two sidings forming a Y extend the length of the plant; all the buildings are grouped within the forked space. This affords railroad facilities within easy reach of all departments and tends to eliminate much car switching and trucking. The Y is of sufficient length so that when proposed building extensions are made, no track alterations will be necessary.

In the main shop, a broad aisle extends the entire length of the building. Starting at the front and continuing toward the rear, groups of machine tools are arranged on either side in well-defined sections. At the extreme front end are the Potter & Johnson automatic screw machine, the New Britain automatic and the hand screw machine sections. On the opposite side of the aisle and balancing these tools respectively are the Cleveland automatic screw machine, the Fellows gear



A SPECIAL GROUP OF MACHINE TOOLS HANDLES THE REAR-AXLE I-BEAMS

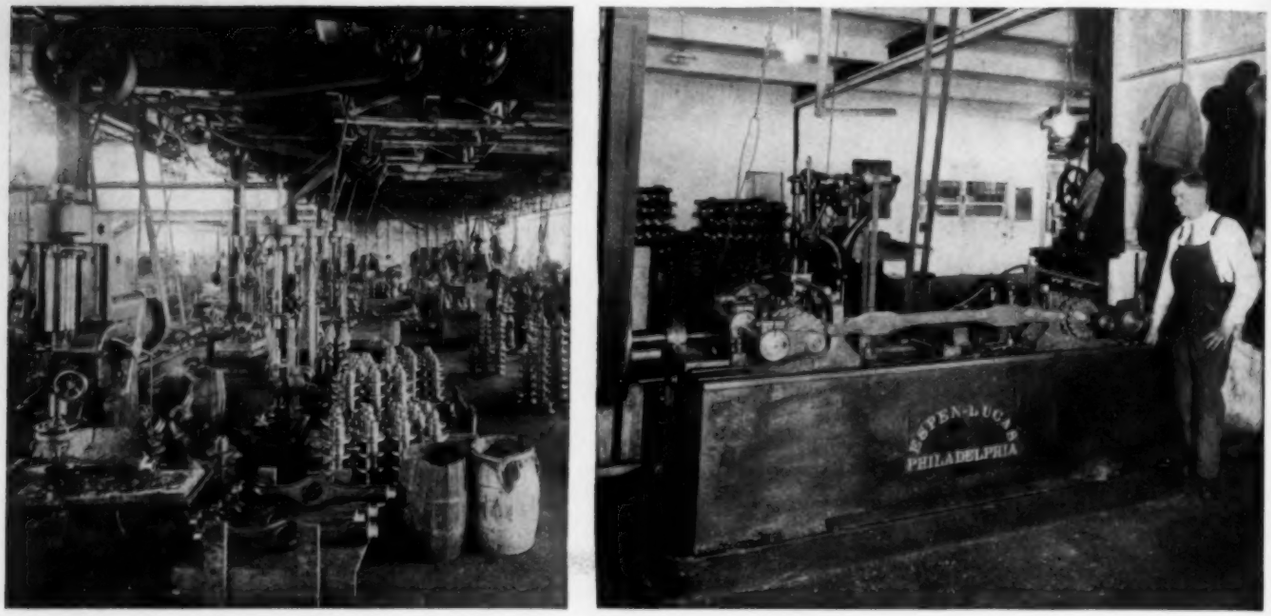
shaper and cutter, and the punch press and wet grinder sections. Directly next to the hand screw machines are the drill section and the inspection department. Opposite is the lathe department and the tool room. Adjoining these latter divisions are the finished material storage section and the assembly section. The final assembly floor, the testing floor and the shipping room occupy the extreme end of the shop. Raw materials enter at the front of the main shop and under this arrangement successive operations are performed with a minimum of trucking. The semi-finished parts move from the automatic screw machines back through the various departments to the shipping floor with digressions in some cases to the heat treating department. Frequent inspection is made, but the inspection department is centrally located. This helps the general plan to provide a minimum of trucking.

The movement of raw materials from storage to finished part and final assembly represent a series of closely-co-ordinated operations. Blanks for the internal gears are transported to the rough grinding department, where, after grinding they are taken to the Potter & Johnson automatics in the main shop. Here the gear is rough turned. After this operation, the gears are placed on platforms, trucked to the inspection department and returned to the gear shaping machines. After the completion of the gear cutting process, a second inspection follows. The gears then are sent to the drill press department for the purpose of having rivet holes drilled and countersunk. Further inspection completed, the internal gears are removed to the heat treating department where, after this process they are sent to the main shop, ground in the wet grinding department and finally inspected and placed in the finished parts storage section. From this department, the internal gears are re-

PINIONS ARE TURNED FROM BAR STOCK BY SEVERAL OF THESE AUTOMATICS

quisitioned for the subassembly department as needed. The same general procedure is followed by the numerous other parts required for the axle. Some of the major parts are pinions, spindles, differential gears and jackshafts. Deviations from this procedure are obviously necessary in the case of some parts. One instance of this is the brake camshafts. These are rough turned, sheared, upheaded, threaded, heat-treated and ground in the order named. The main difference in the procedure being the upheading operation. The axle I-beams do not follow this same sequence of operations.

The I-beams are taken directly to the lathe department. This department incidentally is engaged for the most part on work connected with the finishing of this section only. The operations involved are: Drilling of all center holes on a Bemis & Smith drilling machine; rough turning the trunnion, milling of lugs, drilling the ends for the axle spindle, shrinking of spindles in the trunnions and counterboring. Frequent inspection is given in the intervals between processes. One of the unique features of this department is the boring operation wherein the axles are bored for the hub spindles. To accomplish this work with the greatest possible expedition, a special Jones & Lamson first turret lathe is installed. This machine has two spindles and bores



VIEW OF THE DRILL PRESS SECTION ILLUSTRATING THE OVERHEAD MOTOR DRIVE USED IN THE PLANT—AT THE RIGHT A MACHINE FOR SIMULTANEOUSLY MILLING EIGHT SURFACES OF A FRONT AXLE IS SHOWN

both ends of two axles simultaneously. The two axles are bored at the same time and one man practically does the work of two. The shrinking of spindles in the trunnions also is done in this section. The two ends of the axles are heated by means of blow torches. The torches then are withdrawn and the spindle is inserted. This is held in position by means of a template until it is secured by the contraction of the trunnions.

The group of Potter & Johnson automatics is engaged principally in the machining of internal gears, hubs, carriers, differentials and cup flanges. Blanks for these machines are furnished from the raw materials storage. On the Cleveland automatics in the section opposite, the operations consist principally of the cutting of pinions from bar stock. The semifinished parts pass from this section to the gear shapers in the adjacent division. In this section made up mainly of gear shapers and cutters, the teeth are cut on internal gears and ring gears. A broaching machine in this section is used to broach steering knuckles, and pinions. Milling machines located here spline and mill the gear ends of the jackshafts. Rivet holes are drilled and countersunk in the internal gears also in this department. In the division opposite, hand screw machines, are utilized for rough turning jackshafts, spindles and camshafts. Thread cutting machines located here also thread the camshafts.

A group of drill presses next in line is equipped with multiple spindle heads, to drill holes for the brake carriers, jackshaft tubes, hubs and similar parts. Constant-speed, alternating-current motors suspended from the ceiling drive the machine groups. Subassembly consists in riveting the brake carriers to the axle, bolting on the camshaft brackets, attaching the external and internal brakes and assembling the differential gear in its malleable iron housing. Upon the completion of the final assembly, the axle is mounted on a testing stand, connected with a dynamometer. It is tested under conditions closely approximating those encountered in actual service.

The accompanying view of the heat treating department displays the facilities of this department to advantage. Arranged along the right are the furnaces: The first is a forging furnace which is used to heat the brake camshafts preceding the upheading operation. Farther toward the rear, are melting pots for drawing. Hardening is done in the four furnaces at the end of the building. Quenching tanks may be seen immediately back of the bulldozer. There are two quenching tanks, one containing oil, the other a solution. All the furnaces are heated by oil. The oil is piped into the building from the supply line which runs through the tunnel previously described. At the extreme right of the illustration is a sand blast machine.

Inspections Are Frequent

Frequent inspection of parts contributes toward a high grade finished product. Parts are inspected in the intervals between machining operations and if any does not measure up to the required limits, it is discarded. Parts are billed through the factory in lot numbers. Orders are made out in quadruplicate by the works manager; one copy is sent to the production department; the second to the cost department; the third to the shop and the fourth is returned to the office when the work is completed. Small stations centrally located record the time required to complete the various operations. Most of the work is on a piece basis.

Welfare work has been carefully studied with the idea of assisting employes in every possible manner. An important branch of this effort is the encouragement given to employes to take up home work. As a means of encouraging the employe in this manner, the company pays part of the tuition for any course the former may desire. It permits the workman to pay his share of the cost in regular installments. A small co-operative store has been installed for the benefit of the workmen. A restaurant operated in connection with the plant supplies meals at a low cost. Among the many other forms of welfare work, the company maintains a dispensary with a regular nurse in attendance at all times. Provision has been made for a large and roomy recreation hall and employes are encouraged to participate in athletic sports of all kinds. Once a month, a meeting of foremen is held to discuss shop problems and to stimulate enthusiasm in the co-operative plans which the company has sponsored. An employes' benefit association is conducted by the organization which, by the payment of small dues, entitles the workman or his family to benefits, in case of illness or death. After employes have been on the payroll for a period exceeding six months, they are insured under the group plan. The efficiency that prevails in the operation of the plant has been applied by the company in its treatment of the labor problem

with the result that the number of dismissals is small and the turnover is at a minimum.

The officers of the company are: V. V. Torbensen, president and consulting engineer; J. O. Eaton, treasurer and general manager; W. F. Rockwell, assistant general manager and factory manager; C. I. Ochs, purchasing agent; R. C. Enos, general manager of sales; H. G. Weymouth, general superintendent.

Crane Built in Two Weeks

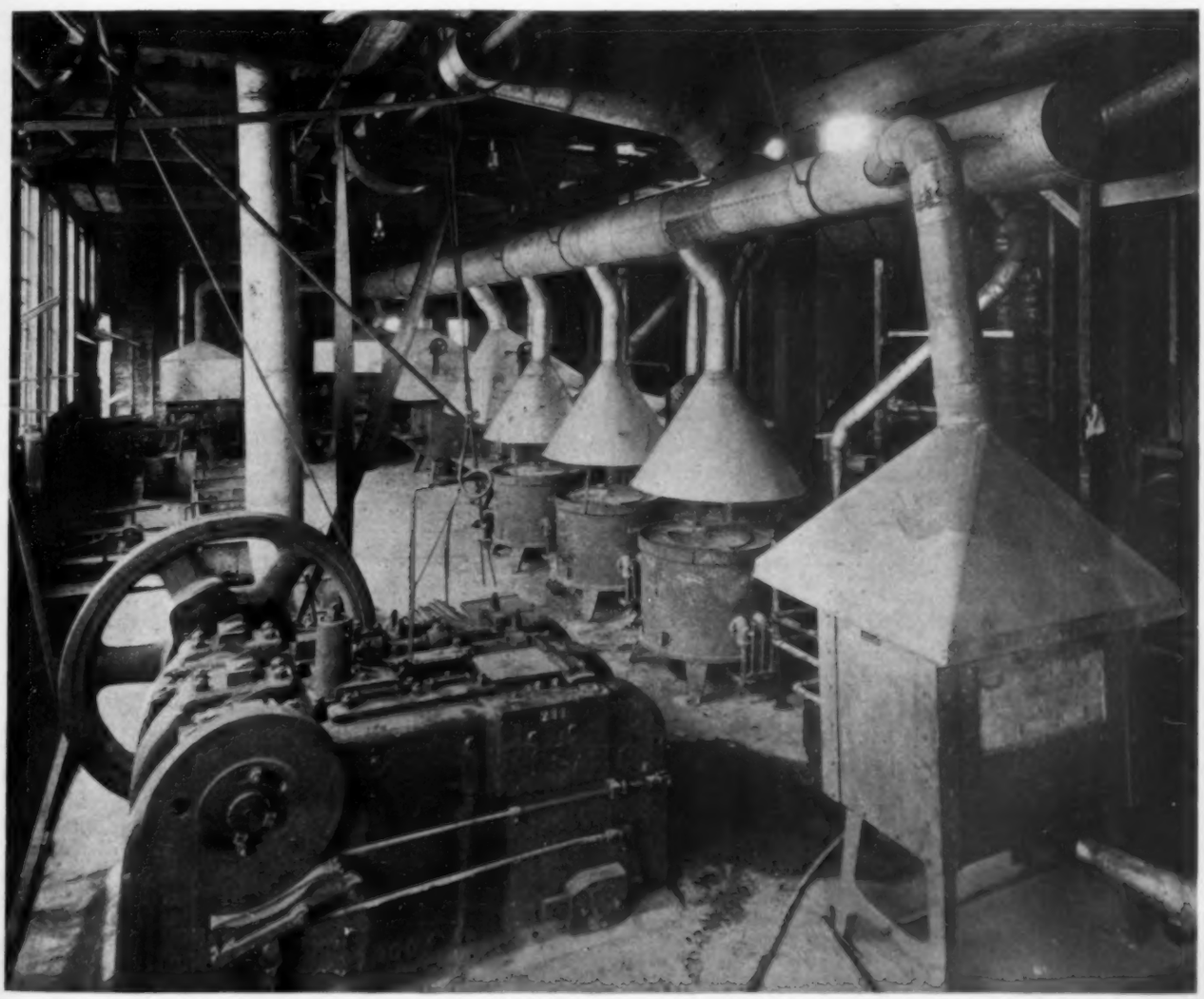
The Alliance Machine Co., Alliance, O., recently built and delivered a special 35-ton traveling crane for the Allis-Chalmers Mfg. Co., Milwaukee, in the remarkably short time of 14 days. Ordinary deliveries on cranes of this type are from 75 to 90 days, and the best previous bid in the records of the navy department is 90 days. The crane was purchased with the co-operation of the navy department since it will be used in the Allis-Chalmers plant for handling propeller shafts during tempering operations. The crane is designed especially for the purpose of transferring the shafts from the furnaces to the quenching baths in the quickest possible time and for this purpose a lowering speed of 140 to 150 feet per minute has been provided. The hoist is provided with two large motors and the hoisting speed is practically one-half that of the lowering speed.

The crane is equipped with one of the standard 75-ton ladle trolleys built by the Alliance Machine Co. The patterns, of course, were on hand, but they had to be changed in order to take care of the special electrical equipment.

The necessary castings were made at the plant of the Otis Steel Co., Cleveland. This company made special efforts to expedite the work. The patterns and castings were handled between Alliance and Cleveland by motor trucks in order to save time. While the trucks were returning to Alliance with the castings, the stage was set in the machine shop so that there was no delay in going about the work of machining. The structural material was fabricated from plain steel in stock. The bridge was designed and fabricated in exactly a week. This crane has a span of 50 feet and operates on a runway 140 feet long.

In appreciation of the record, Josephus Daniels, secretary of the navy, wrote the Alliance Machine Co. a complimentary letter, congratulating it on its success in filling the order so promptly.

Iron founders and blacksmiths at Shanghai, China, who are earning from $7.50 to $14 per month according to the grade of work have asked through the Guild of Iron Founders for an increase of 5 cents a day, according to Consul General Thomas Sammons. The increased cost of food products, particularly rice, have made increased wages in China necessary.



HARDENING AND DRAWING OPERATIONS ARE FACILITATED BY OIL-FIRED FURNACES—TO HEAT BRAKE CAMSHAFTS PRELIMINARY TO UPHEADING, THE FORGING FURNACE AT THE EXTREME RIGHT IS USED

Thermal Refinement of Gear Blanks

Greatest Influence on the Location of the Critical Point is Exerted by Carbon —Annealing of Forgings Removes Strains and Eliminates Distortion and the Resulting Noisy Gears

BY C. R. POOLE

IN the past few years great advancement has been made in the heat-treating and hardening of gears. In this advancement the chemical and metallurgical laboratory have played no small part. During this time, however, the condition of the blanks given the machine shop to be machined has not received its share of attention in the heat-treating department of many forge shops, and in many cases has been neglected or not considered by the machine shops themselves. This is especially true of shops using only the lower carbon steels.

There are two distinct types of gears, both types having their champions, namely, carbonized and heat-treated. The difference between the two, in the matter of steel composition is entirely in the carbon content, the carbon never running higher than 0.25 per cent in the carbonizing type, while in the heat-treated gears the carbon is seldom lower than 0.35 per cent. The difference in the final gear is the hardness. The carbonized gear is filed hard on the surface with a soft, tough and ductile core to withstand shock, while the heat-treated gear has a surface that can be touched by a file with a core of the same hardness as the outer surface.

With the exception of several of the higher types of alloy steels, where the percentages of special elements run quite high, which causes a slight air-hardening action, the carbonizing steels are soft enough for machining when air cooled from any temperature, including the finishing temperature at the hammer. This condition has led many drop forge and manufacturing concerns to consider annealing as an unnecessary operation and expense. In many cases the drop forge has only heated to a low temperature, many times just until the piece showed color, to relieve the so-called "hammerstrains". While this has been only a compromise it has been better than no reheating at all, although it has not properly refined the grain which is necessary for good machining conditions.

Heat-treatment, in the broad sense, is the thermal refinement of the structure of steel and covers the four operations, namely: annealing, carbonizing, hardening and drawing or tempering as it is commonly called. All of these operations are based on the fact that in heating a piece of steel the structure undergoes a change at from one to three points on heating and a corresponding number of changes on cooling, these changes being caused by a molecular rearrangement of the carbon and iron. The points are known as "critical points" or "critical ranges" and vary in number according to the composition of the steel. These points on heating are often referred to as "decalescent point" and on cooling as "recalescent point". Carbon exerts the greatest influence on the location of the critical points with nickel and chromium coming next. A straight carbon steel up to 0.35 per cent carbon has three critical points, from 0.35 to 0.89 per cent carbon two critical points are found and over 0.89 per cent carbon only one critical temperature is found. Each 1 per cent of nickel will lower the critical point 20 degrees Fahr., while each 1 per cent chromium raises the point 10 degrees Fahr. Of the critical points those found on a rising temperature are higher than the corresponding points on a falling temperature. Rising temperatures are always considered in correctly heat-treating a piece of steel. In order to produce the most complete rearrangement of the molecules of carbon and iron and therefore the greatest refinement it is necessary to heat to a temperature slightly in excess of the highest critical point.

Purpose of Annealing

Annealing is the heating to a temperature slightly above the highest critical point and cooling slowly either in the air or in the furnace. Annealing is done to accomplish two purposes: To relieve mechanical strains and to soften and produce a maximum refinement of grain.

Carbonizing is the operation of imparting to a low-carbon steel a shell of high-carbon content. This produces what might be termed a "dual" steel, allowing for an outer shell which, when hardened, would withstand wear and a soft, ductile core to produce ductility and withstand shock. The operation is carried out by packing the work to be carbonized in boxes with a material rich in carbon and maintaining the box so charged at a temperature in excess of the highest critical point for a length of time to produce the desired depth of carbonized zone. Generally maintaining at 1650-1700 degrees Fahr. for seven hours will produce a carbonized zone 1/32-inch deep.

Hardening is the heating to a temperature slightly above the highest critical point and cooling suddenly in some quenching medium such as water or oil. This treatment produces a maximum refinement with the maximum strength.

Annealed steels are called pearlitic, pearlite being the name applied to the microstructure of slowly cooled steels. Pearlite is a mechanical mixture consisting of alternate masses of fewite (pure iron) and cementite (cementite being a compound made up of 6.6 per cent carbon and 93.4 per cent fewite) with the resultant mixture containing 0.89 per cent carbon. Pearlite may be present in two forms, lamellar and granular; with the granular occurring either coarse or fine or elongated with bands of fewite separating the elongated grains of pearlite.

When etched in a weak alcoholic solution of picric or nitric acid and examined under the microscope the fewite, untouched by the etching solution, appears white, while the pearlite is shown up as a black constituent.

Proper annealing of low-carbon steels causes a complete solution or combination to take place between the fewite and pearlite, producing a homogeneous mass of small grains of each, the grains of the pearlite being surrounded by grains of fewite. A steel of this refinement will machine to good advantage, due to the fact that the cutting tool will at all times be incontact with metal of uniform composition and will not be alternately coming in contact with

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From a paper presented at the convention of the American Gear Manufacturers' association, White Sulphur Springs, W. Va., April 18-20. The author, C. R. Poole,, is associated with the Frost Gear & Forge Co., Jackson, Michigan.

the soft fewite constituent and the harder carbon particles. While the alternate bands of fewite and pearlite are microscopically sized, the routes has found that with a Gleason or Fellows gear cutter that rough cutting can be traced to poorly annealed steels, having either a pronounced handed structure or a coarse granular structure. A study of the microphotographs of several of the widely used low-carbon steels in gear manufacture will show the condition of the structure direct from the drop hammer, the pronounced banded structure of fewite and pearlite and the change produced by thorough annealing.

Proper Annealing Temperature

Theoretically annealing should be accomplished at a temperature at just slightly above the critical point. However, in practice, the temperature is raised to a higher point in order to allow for the solution of the carbon and iron to be produced more rapidly as the time required to produce complete solution is reduced as the temperature increases past the critical point. Temperatures, exceeding the critical point by over 100 degrees Fahr. should never be used on account of the enlargement of the grains of pearlite and fewite. Microphotographs of a piece of steel annealed at temperatures increasing by 25 degrees from a point below the critical point to the burning point shows clearly the effects of temperature on the grain size.

For annealing the simpler types of low-carbon steels the following temperatures have been found to produce uniform machining conditions on account of producing uniform fine grain pearlite structure.

1.15 to 0.25 per cent carbon straight carbon steel.
Heat to 1650 degrees Fahr. Hold at this temperature until the work is uniformly heated, pull from the furnace and cool in air.

0.15 to 0.25 per cent carbon 1½ per cent nickel, one-half of 1 per cent chromium steel.
Heat to 1600 degrees Fahr. Hold at this temperature until the work is uniformly heated, pull from the furnace and cool in air.

0.15 to 0.25 per cent carbon 3½ per cent nickel steel.
Heat to 1575 degrees Fahr. Hold at this temperature until the work is uniformly heated, pull from the furnace and cool in air.

In the annealing of the higher types of chrome-nickel steel, with the nickel content running about 3 per cent and the chromium about 1 per cent the operation is more difficult, as rapid cooling through the upper critical range produces a hardness due to the slight air hardening properties of steel of this composition. The annealing of this type of steel requires considerable more attention both in the heating and cooling. To produce the best machinability of this steel the following practice will give satisfactory results:

Heat to a temperature in excess of the critical point about 100 degrees Fahr., holding at this temperature for a considerable time to allow for thorough heating and complete solution of the cementite; cool rapidly, either by pulling from the furnace into air or opening up the furnace doors, to a point at which the forgings show no color in daylight; reheat to a point just in excess of the highest critical point and cool slowly in the furnace. The temperatures, length of heating, time and rate of cooling, are dependent on analysis, size of forging and weight of the load of forgings in the furnace.

Not only will benefits in machining be found by careful annealing of forgings but the subsequent troubles in the hardening plant will be greatly reduced. The advantages in the hardening start with the carbonizing operation, as a steel of uniform and fine grain size will carbonize more uniformly, producing a more even hardness and less chances for soft spots. The holes in the gears will also "close in more uniformly", not causing some gears to require excessive grinding and others with just enough stock. Also all strains will have been removed from the forging, eliminating to a great extent distortion and the resulting noisy gears.

With the steels used for the heat-treated gears always of a higher carbon content, treatment after forging is necessary for machining, as it would be impossible to get the required production from untreated forgings especially in the alloy steels. The treatment is more delicate, due to the higher percentage of carbon and the natural increase in cementite, together with complex carbides which are present in some of the higher types of alloys. Due to the many analyses of heat-treated gear steel it is impossible to give in this paper specific treatments, but the general procedure is practically the same as for the case hardening, 3 per cent nickel, 1 per cent chromium steel given earlier. More time should be given to permit the complete solution to take place and the rate of cooling watched closely, together with the temperature at which the forgings are pulled from the furnace. For a furnace load, weighing 550 pounds, of medium section forgings made from a steel of 0.50 per cent carbon, 0.60 per cent manganese, 3 per cent nickel, 1 per cent chromium, the following treatment gave good machining conditions on turning operations as well as on the Fellows gear shapers:

Heat to 1330 degrees Fahr., taking two hours to heat to the temperature. Hold at the temperature for 1½ hours and allow to cool in furnace to 1170 degrees Fahr., taking about one hour to cool. Reheat to 1230 degrees Fahr., consuming three-fourths hour to reheat. Hold at 1230 degrees Fahr. for 1¼ hours. Cool slowly in furnace, not faster than 75 degrees for the first hour, until 900 degrees Fahr., then cool in air.

Incomplete Solution of Cemetite

In the heat-treated steels poor machining conditions are present, generally due to incomplete solution of cementite rather than bands of free fewite, as in the case of case-hardening steels. This segregation of carbon, as it is sometimes referred to, caused hard spots which, in the forming of the tooth, causes the cutter to ride over the hard metal, producing high spots on the face of the tooth which is as detrimental to satisfactory gear cutting as the drops or low spots produced on the face of the teeth when the pearlite is coarse-grained or in the banded condition.

The following gives a few of the hardening numerals on steel used in gear manufacture that produce good machining qualities:

	Per cent	Per cent	Per cent
Carbon	0.20	0.50	....
Nickel	3.00	3.00	....
Chromium	1.25	1.00	....
Carbon-chrome-vanadium	....	....	0.50
Brinell test	156–170	179–187	170–179

In the simpler carbonized steels it is not necessary to test the forgings for hardness after the anneal, but with the high percentages of alloys in the carbonizing steels and the heat-treated steels a hardness test is essential. For this test the Brinell hardness tester is far more accurate than the sclerescope test. However, the Brinell test should not be used without the aid of the microscope. To obtain the best results in machining, the microstructure of the metal should be determined and a hardness range set that covers the variations in structure that produce good machining results. By careful control of the heat-treating operation and with the aid of the Brinell hardness tester and the microscope it is possible to continually give forgings that will machine uniformly and be soft enough to give desired production.

Installs New Galvanizing Machine

The Hanlon-Gregory Galvanizing Co., Pittsburgh, has installed a Watrous galvanizing machine, an invention of E. L. Watrous, Des Moines, Iowa. The apparatus is designed to handle small products such as nuts, bolts, nails, wood screws and other similar articles. The machine is simple. It consists of a heavy frame 16 inches square by 12 inches deep, with a self-locking lid bolted to the top of an upright shaft. This shaft, which is revolved at a high rate of speed, is equipped with a friction clutch and a brake. Only the frame extends above the floor level; the base containing the gears and mechanism, as well as the belt running to the electric motor, is in a covered pit below the floor level. A sheet-steel jacket surrounds the frame to catch the flying zinc.

The work to be galvanized is placed loosely in a basket made of wire or perforated steel. From 50 to 100 pounds are treated at one time. Two men lift the basket by means of a piece of pipe run through the handles, and lower it into the kettle. When the contents are sufficiently soaked, the basket is lifted out and transferred quickly to the machine. One man pulls out the pipe, while the other slams down the lid and throws on the power. The machine takes about three seconds to get up to its speed of 750 revolutions per minute. The surplus zinc, which flies out through the spaces in the basket, is caught against the jacket and falls to the floor, from which it may be picked up and used over again. In about 10 seconds the surplus is all thrown off; the operator then steps on the brake, stops the machine, lifts out the basket and dumps the contents on the floor for cooling. It is said the machine will handle on an average about 150 baskets per hour.

Heads and baskets of different sizes and shapes may be used on the machine; one has been built to handle work 4 feet long. The greatest field for the machine, however, is on small castings or steel stampings, rivets, tacks, nails and especially bolts and wood screws. It is claimed these can be galvanized so smoothly that the nuts will go on the bolts without re-cutting the threads, and yet they will stand four times the United States government test for galvanizing.

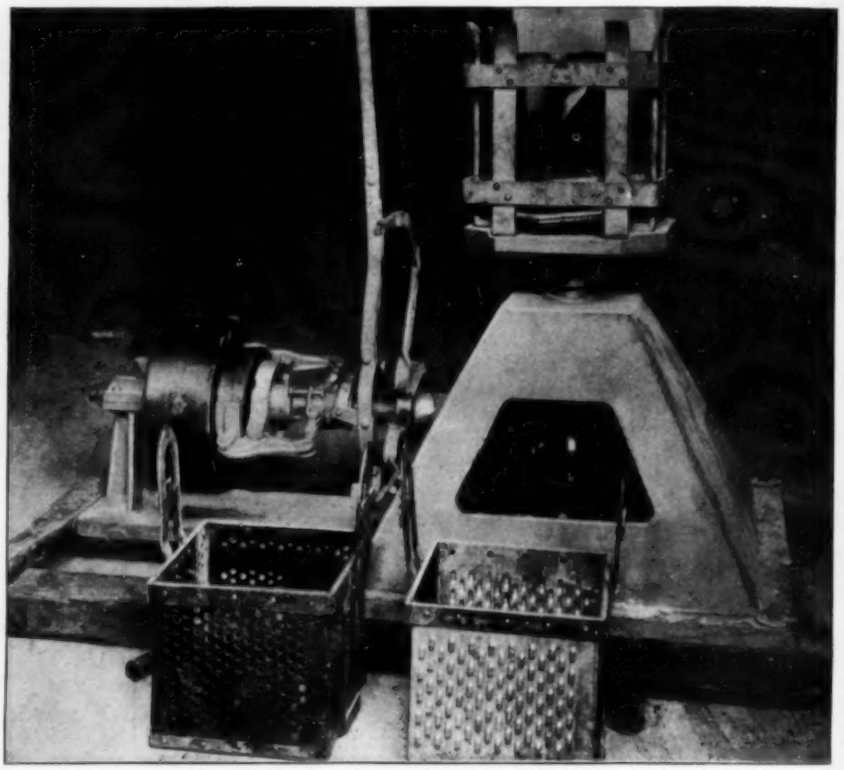
Either a bright or soft finish may be secured as wanted. If the former is desired, the parts are dumped into cold water as soon as the surplus zinc is thrown off; when a darker coat is wanted the work is allowed to cool slowly without quenching.

The machine is specially adapted to coating shingle nails which are difficult to handle by ordinary methods on account of their tendency to pack and stick together. Using the Watrous machine it is said that nails can be galvanized with an addition of only 2½ per cent zinc, compared with 10 to 15 per cent required by ordinary dipping processes.

The Watrous patents are based on the fact that the basket and its contents are whirled together, no attempt being made to transfer the hot, dripping contents of the pot to a cold basket, which causes the zinc to solidify and form lumps wherever there is contact with cold metal.

The thickness of the coat depends on the length of time the work is cooked. In none of the experiments with the device has it been possible to get a coat so thin it will not pass the government four-dip copper-sulphate test, and by proper immersion it may be made to stand 20 dips or more.

The greatest value of this process, however, is said to be in its cheapness. It saves from 50 to 70 per cent of the zinc that would be put on by hand dripping, and this surplus, if allowed to remain, would be an actual detriment to the work, as it is in the shape of lumps, drips and rough spots. It also saves on labor and all other expenses. The machines are put out on a royalty basis at cost, and royalties of 20 cents per 100 pounds on screw-threaded articles, and 10 cents per 100 pounds on all other articles are charged.



A CENTRIFUGAL MACHINE FOR HOT GALVANIZING

New Coal Mine Assures Steady Supply

Shafts are being sunk by the Buckeye Coal Co. at Nemacolin, Greene County, Pa., about 80 miles south of Pittsburgh on the Monongahela river. The Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co., Youngstown, O., owns about 7000 acres of coal land and the main tonnage of coal will be handled from a shaft equipped with two 10-ton balanced skips. The hoisting equipment is designed to handle 750 tons of coal per hour. A 1500-ton storage bin will be built at the mouth of the shaft. Facilities for screening and picking coal will also be installed. The tipple will be built so that coal can be loaded either in railroad cars or barges. In addition to the main shaft, a slope for handling the men and material is being sunk. This slope will be provided with a tipple and a hoisting engine which will operate six loaded cars to a trip. A 20-foot air shaft in conjunction with a fan which delivers 400,000 cubic feet of air per minute will ventilate the mine. Electric power will be purchased to operate the entire plant. However, auxiliary boilers are being installed to operate the fans, pumps, etc., in case of emergency. Houses for the officials and miners are already under construction.

Steel Foundry Methods on War Work

Successful Production of Army and Navy Castings Demands Detailed Attention to the Molding Practice—Heat Numbers Stamped on Every Casting —Many Inspections and Tests Are Made

DURING the past few months many steel foundrymen have turned their attention to the production of ordnance castings. In every case this work has been undertaken in a thoroughly patriotic spirit, and in many instances government tonnage has been accepted at a considerable sacrifice and under conditions which have made it necessary to make extensive changes in shop equipment and methods. Without exception, however, the situation has been faced cheerfully, the main object of every foundryman turning out ordnance castings being to produce the best possible product without much reference to cost or contract prices. Experience has shown that castings made under government contracts for military purposes cannot be produced as cheaply as work of similar quality turned out for private individuals or corporations. Part of this additional cost is due to the necessity for enforcing specifications which are more stringent than commercial work requires. Additional expense also is incurred in providing facilities for carrying out the routine required by the government's methods which call for the individual examination and marking of each casting. This is perhaps the most important particular in which government work differs from ordinary practice. The ordnance departments of both the army and the navy insist that the heat number be stamped on every casting regardless of its importance or size. In addition, each casting must be examined by a government inspector prior to annealing and again when it is finally finished. Numerous test bars are demanded, many of which must be attached to the castings in specified positions. All of these bars must be tested and their chemical and physical characteristics determined. The requirements of the government as to sulphur and phosphorus are stringent; there is also a lack of uniformity in the specifications of the different branches of the service. Although this irregularity is slight, it is sufficient to make it necessary to use somewhat different methods on navy castings than on army work and still others on work for the Emergency Fleet corporation.

This situation has been summed up in a report of a special committee appointed by the Steel Founders' society in which it is stated that the "government specifications are so written and applied that it is impossible to produce steel castings at anything like the same cost or quantity as those subject to commercial specifications and inspection, on account of the requirements which call for so much handling in the cleaning and finishing departments."

Through their organization, steel founders are exerting their influence to have certain apparently unnecessary requirements of the government modified in order to make possible the production of a greater tonnage of castings of suitable quality. While these negotiations are in progress, the melters are going ahead cheerfully under existing conditions, straining every nerve to realize the maximum output so urgently needed for the prosecution of the war. At the same time, various prominent foundrymen are giving close study to the problem of turning out castings economically under existing government regulations, and as a result, methods have been devised which have somewhat improved the situation.

The Sivyer Steel Casting Co., Milwaukee, which is now devoting two-thirds of its large capacity to government work, has gone into this problem exhaustively. The methods devised by the Sivyer company have been

FIG. 1—THE HEAT NUMBER MUST BE STAMPED ON EVERY GOVERNMENT CASTING REGARDLESS OF ITS SIZE—TWO MEN ARE REQUIRED FOR THIS WORK

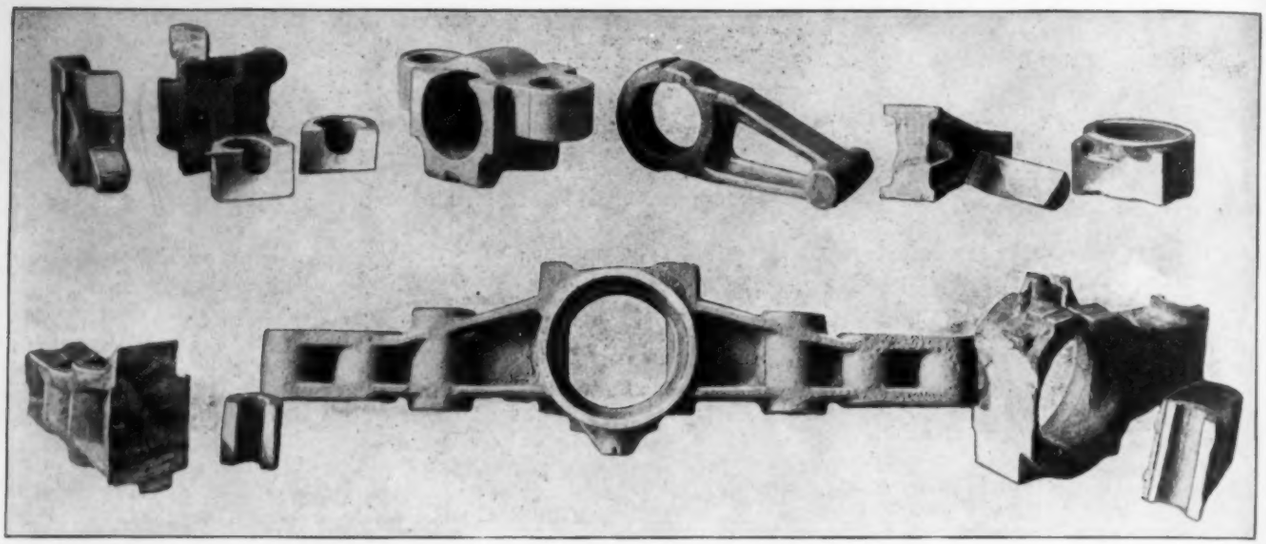


FIG. 2—BEFORE THE MOLDING PRACTICE IS STANDARDIZED SAMPLE CASTINGS ARE MADE AND SAWED APART TO REVEAL HIDDEN DEFECTS

unusually successful in accelerating the production of ordnance castings and in reducing of the cost of meeting the requirements of the government. These methods, therefore, are worthy of special attention.

The Sivyer company is making gun caisson and limber castings for 75 and 155-millimeter field guns, mount castings for 155-millimeter guns, 5-inch navy gun castings, as well as wheels and other special castings for motor trucks for the ordnance and quartermaster departments.

Three classes of castings are made for the ordnance department. They must conform to the following physical and chemical specifications:

No. 1 Cast Steel.—Elastic limit, 25,000 pounds per square inch; tensile strength, 60,000 pounds per square inch; elongation after rupture, 16 per cent; contraction of area, 24 per cent; sulphur under 0.07 per cent; phosphorus under 0.05 per cent.

No. 2 Cast Steel.—Elastic limit, 35,000 pounds per square inch; tensile strength, 75,000 pounds per square inch; elongation, 15 per cent; contraction of area, 20 per cent; sulphur under 0.07 per cent; phosphorus under 0.05 per cent.

No. 3 Cast Steel.—Elastic limit, 45,000 pounds per square inch; tensile strength, 85,000 pounds per square inch; elongation, 12 per cent; contraction of area, 18 per cent; sulphur under 0.07 per cent; phosphorus under 0.05 per cent.

All of the navy castings made by the Sivyer company are Grade *B*. These castings must conform to the following requirements:

Tensile strength, 60,000 pounds per square inch; elastic limit, 45 per cent of the tensile strength; elongation, 22 per cent; contraction of area, 30 per cent; sulphur under 0.05 per cent; and phosphorus under 0.06 per cent.

It will be noted that these specifications are severe particularly for No. 3 army and Grade *B* navy castings. The sulphur and phosphorus limits also are exceptionally stringent in view of present market conditions. In fact, this situation is so serious that the Steel Founders' society in its petition to the government recommends that the sulphur and phosphorus maximums be fixed at 0.06 per cent for open-hearth castings, with an allowance of 0.08 per cent sulphur and 0.07 per cent phosphorus in converter steel castings.

In view of these circumstances, the

FIG. 3—AXLE-BRACKET FOR GUN CAISSONS ARE MOLDED ON ROCK-OVER MACHINES

success of the Sivyer company in turning out a large percentage of satisfactory heats, is commendable. The officials of the company attribute this success partially to close attention to detail and partially to the use of the electric furnace for melting the metal. The accompanying table shows the result achieved by the Sivyer company on a number of heats. This indicates clearly what the steel foundrymen of the country are doing to meet the government's requirements.

The successful production of castings for military purposes demands detailed attention to the molding practice. At the Sivyer plant all of the army and navy castings are made on molding machines in order to insure uniformity in the size and finish of the work. The machines also materially reduce the cost of the molding operations. Whenever a new job is taken up, it is carefully studied and an effort is made to develop the best possible procedure. To this end, before any work is started through the shop on a production basis sample castings are made, employing various methods of molding and gating, and sawed apart in order to reveal any hidden defects. A number of sample castings which have been subjected to this preliminary examination are shown in Fig. 2. As soon as a satisfactory method of molding is developed, the sample castings are submitted to the representatives of the government for approval. The molding method which has been found to produce sound castings is then standardized and the patterns and rigging arranged for quantity production.

The care with which molding details have been worked out is indicated in Fig. 4, which shows the method of molding the drag for a 36 x 6-inch, plate-type military-truck wheel. A jar-ramming, rollover, pattern-drawing machine built by the Herman Pneumatic Machine Co., Pittsburgh, is employed. The flask for the drag is 38 inches square and 12 inches deep. The cope, which is similar to the drag in its general outlines, is molded on a jar-ramming, turnover, pattern-drawing machine furnished by the International Molding Machine Co., Chicago. With two men on each machine, 60 molds are turned out per day. The arrangement of the gating is clearly shown in Fig. 4. The runner is in one corner of the flask, the gate being of the bottom-pour variety with several feeders leading into the lower rim of the casting. It will be noted that the brake drum is cast integrally with the wheel itself. The finished casting weighs 220 pounds. The weight of the rough castings with gates and risers attached is 290 to 300 pounds. This is one of the heaviest castings made by the Sivyer company, which specializes on light work. The wheels are molded in a special bay from which they are transferred by cranes to a convenient position near the furnaces for pouring. The wheel molds are poured with steel proportioned to meet the specifications of the American Society of Automobile Engineers. Its general characteristics are similar to No. 3 ordnance steel. Fig. 13 shows wheels of this type being machined. The principal difficulty encountered in making these castings arises from the strains occurring at the junction between the comparatively thin plate and thick rim. This has been overcome largely by the liberal use of risers and by pouring the steel at the proper temperature.

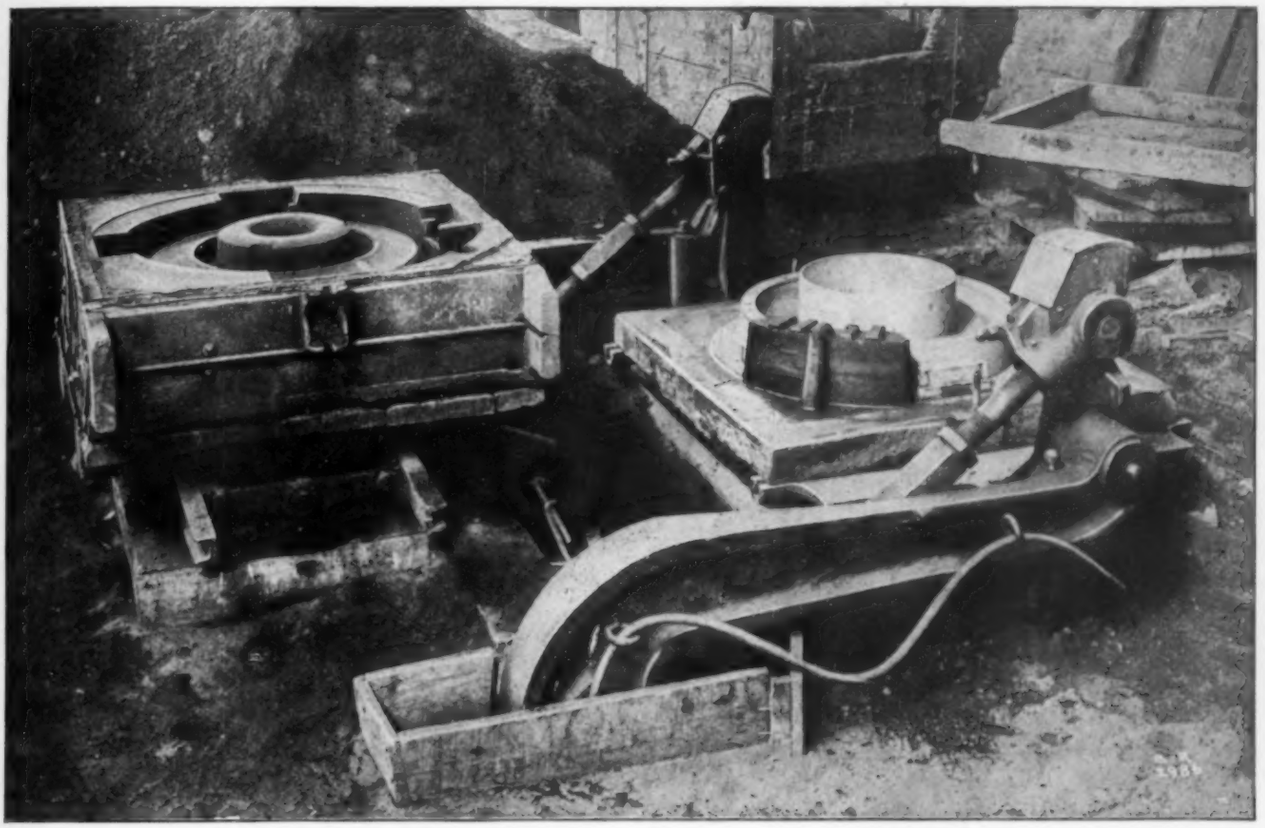


FIG. 4—MOLDING THE DRAG FOR A 36-INCH PLATE-TYPE MILITARY-TRUCK WHEEL ON A JAR-RAMMING, ROLL-OVER, PATTERN-DRAWING MACHINE

Another method of molding ordnance castings is illustrated in Fig. 3, which shows axle-brackets for 155-millimeter gun caissons. Power roll-over-draw machines of the standard type built by the Tabor Mfg. Co., Philadelphia, are employed for this work. The copes are molded on the machine at the left and the drags on the one at the right. As fast as the molds are completed, they are slid

down the skids, shown in the foreground of Fig. 3. These skids deliver the molds to the pouring floor where they are arranged as indicated in Fig. 5, which shows part of a day's work with some of the cores set. Two castings are made in each flask and four men turn out from 30 to 40 molds a day including the core setting and closing operations. Round cores of a comparatively simple type are used. Before they are closed, the molds are carefully skin-dried with a gas torch. Steel flasks, 34 inches long and 22 inches wide, are employed. Both the copes and drags are 8 inches deep. The castings are poured from one runner in the middle of the flask, with centrally located gates extending to each mold. In pouring these castings No. 3 ordnance steel is used.

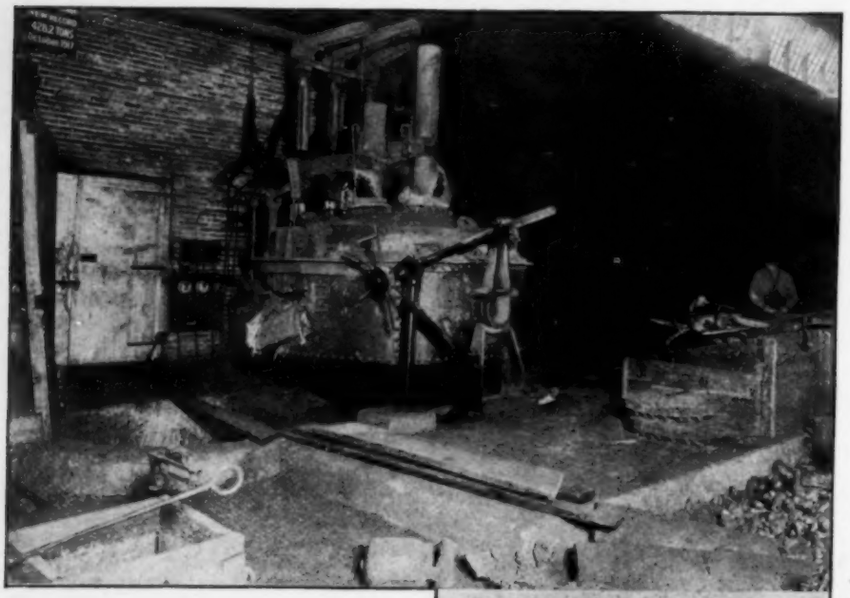


FIG. 5—ORDNANCE STEEL IS MELTED IN ELECTRIC FURNACES

Electric Furnaces Used Exclusively

Electric furnaces are employed exclusively at the Sivyer plant for melting the metal for military castings. After considerable experimenting, the officials of the company have concluded that the electric furnace offers special advantages for this class of work on account of the possibility of exercising accurate control over both the temperature and composition of the heats. The freedom of electric steel from oxidation also is a factor.

Two furnaces are used, including a 1-ton, single-phase, single-electrode Snyder type furnace and a 3-ton, 3-phase Moore furnace built by W. E. Moore & Co., Pittsburgh. The latter is shown in Fig. 5 and its general characteristics are clearly indicated. Standard practice has been followed in designing the furnace and a special effort has been made to provide parts that are amply proportioned, thus avoiding breakdowns and excessive repairs. A 3-ton heat is melted down in about 2½ hours in the Moore furnace. The furnace has been in operation only since December. The Snyder furnace has been operating for nearly two years with good results.

FIG. 6—A FLOOR OF AXLE-BRACKET MOLDS SHOWING METHOD OF SETTING CORES

The charges consist of specially selected scrap steel with occasionally a little low-phosphorus pig iron. The general practice, however, is to melt all-scrap heats. Croppings from shell forging plants are utilized together with springs, knuckles, and other high-grade steel scrap. Care is exercised to keep the sulphur and phosphorus in the charge low and all of the scrap is carefully analyzed before it is used so that the melter knows exactly how to proportion his charges to obtain steel of the correct composition.

During the heat the carbon is watched carefully and preliminary color tests for carbon are run from time to time in order to obtain the correct carbon content. The charges are proportioned to obtain the following percentages of carbon in the finished castings:

	Carbon, per cent
Class B navy steel	0.20 to 0.25
No. 1 ordnance steel	0.20 to 0.25
No. 2 ordnance steel	0.30 to 0.35
No. 3 ordnance steel	0.38 to 0.42

How the Castings Are Stamped

In ordinary steel foundry practice it is not customary to handle the castings individually in the annealing, cleaning and finishing departments. As previously pointed out, however, the government insists that each casting be inspected individually and in addition demands that the heat number be stamped on the casting. Special arrangements are necessary to accommodate this practice. At the Sivyer plant, as soon as a heat is poured and the castings sufficiently cool, the molds are shaken-out and all of the castings together with the test bars for that particular heat are placed in a steel bucket which carries a tag bearing the heat number. Usually the tag consists simply of a piece of board on which the heat number is written with chalk. This bucket is transferred to the cleaning department where the castings and test bars are stamped with the heat number. This operation is shown in Fig. 1. Two men are required and every casting must be stamped. Stamps manu-

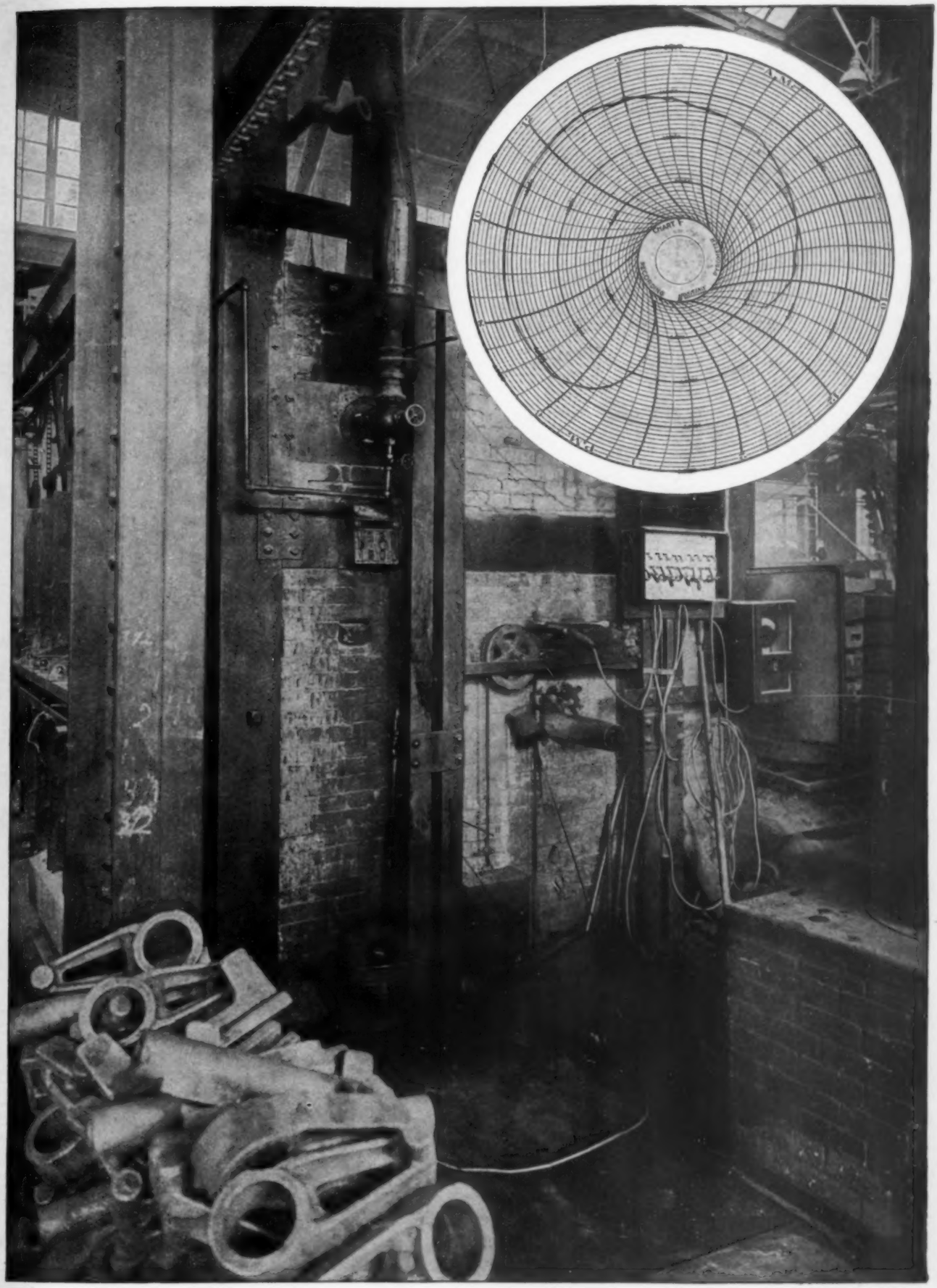


FIG. 7—ANNEALING IS AN EXTREMELY IMPORTANT PROCESS IN MAKING ORDNANCE CASTINGS AND COMPLETE PYROMETER CONTROL IS NECESSARY. FIG. 8—A SAMPLE PYROMETER CHART SHOWING ANNEALING TEMPERATURES

factured by James H. Matthews & Co., Pittsburgh, are employed. They are provided with movable numbers and are so arranged that the entire heat number may be marked on the casting with one blow of the sledge.

Another method of marking the castings is to print the heat numbers in the molds. The numbers then appear on the castings in raised figures. The Sivyer company has found this method less satisfactory than the one just described because it prevents the molds from being held from one heat to another and in case there should not be enough metal in the furnace to pour all of the molds on the floor those left over would either have to be scrapped or the numbers chiseled off of each casting and corrected. After the castings are properly marked with the heat numbers, the heads and gates are removed and the castings are sand-blasted. It is not possible to anneal the castings immediately since it is necessary to determine the chemical analysis of each of the test bars. The results of these analyses must be submitted to the government inspectors for their approval. This requires time and in the interval the castings must be stored conveniently and in an orderly manner.

The castings, therefore, are taken out into the yard during this period and stored in rough wooden boxes according to heat number. Each box bears a sign giving the heat number of the castings in that particular lot. This temporary storage yard is shown in Fig. 9.

After the analyses are completed the castings must again be rehandled and heats of similar chemical composition assembled together for annealing. Before being loaded on the annealing-oven cars the castings are taken into the cleaning room, Fig. 10, where they are ground, chipped and then inspected both by the representatives of the manufacturer and the government. The government inspection is exceedingly minute, each casting being examined individually and stamped approved by the inspector if passed. Fig. 11 shows the government inspector at work examining green castings for gun caissons. Castings which are approved by the inspector are then piled up on the annealing oven cars, as shown in Fig. 12.

Some castings have to be welded to remove slight defects before annealing. The government inspector has authority to decide whether the casting should be reclaimed in this manner or scrapped. In some shops this has caused differences of opinion and losses of a serious nature. The experience of the Sivyer company along this line has been generally satisfactory.

An oil-fired annealing oven, some of the details of which are shown in Figs. 7 and 12, is employed. It is of the double-end, continuous, car type. Two cars are provided and while one

FIG. 9—WHILE THE TEST BARS ARE BEING ANALYZED THE CASTINGS ARE STORED IN BOXES IN THE YARD ACCORDING TO HEAT NUMBERS

Table I

Result of Tests of Castings Made for Government

Heat No.	Kind of steel	Elastic limit lbs. per sq. in.	Tensile strength lbs. per sq. in.	Elongation in 2 in., per cent	Reduction of area, per cent	Phosphorus, per cent	Sulphur, per cent	Silicon, per cent	Manganese, per cent	Carbon, per cent
299	No. 8	50,750	84,900	20.1	27.4	0.041	0.050	0.25	0.74	0.421
310	No. 3	54,000	100,400	17.5	20.4	.....	.....	....	....	.....
335	No. 3	46,870	89,500	18.7	23.5	0.045	0.055	0.50	0.80	0.427
284	No. 3	46,150	92,450	18.0	23.2	0.034	0.051	0.35	0.78	0.435
261	No. 3	48,650	101,450	11.5	20.2	.....	.....	....	....	.....
297	No. 3	48,850	86,420	18.6	23.6	.....	.....	....	....	.....
314	No. 3	48,750	88,800	14.2	18.4	.....	.....	....	....	.....
291	No. 3	55,020	94,620	16.2	22.6	.....	.....	....	....	.....
348	No. 3	51,600	100,200	13.2	15.8	0.042	0.040	0.54	0.75	0.433
330	No. 3	47,000	88,350	18.0	20.6	0.051	0.049	0.36	0.85	0.371
3279	Class B	37,500	67,580	31.7	37.1	.....	.....	....	....	.....
3280	Class B	41,200	68,200	31.6	46.2	0.044	0.054	0.25	0.35	0.235

FIG. 10—EXTENSIVE CLEANING ROOM EQUIPMENT IS REQUIRED FOR PRODUCING ORDNANCE CASTINGS

FIG. 11—EACH CASTING IS EXAMINED AND STAMPED BY THE GOVERNMENT INSPECTOR BEFORE ANNEALING—THOUSANDS OF PIECES MUST BE HANDLED EVERY DAY

FIG. 12—AFTER THE CASTINGS ARE PASSED THEY ARE PILED ON THE ANNEALING-OVEN CAR FOR HEAT TREATMENT

load of castings is being treated the other car is unloaded and reloaded. The oven cars run on a depressed track so that loading platforms are level with the foundry floor.

The oven is of substantial construction with fire-brick walls and a heavy structural steel framework. In order to handle a greater output of annealed castings, the Sivyer company is now building a new annealing oven of a similar type.

Pyrometers Record Temperatures

Fig. 7 shows the pyrometer installation by means of which the heat is controlled. The details of the oil-burner also are shown in this illustration. The burners are of the air atomizing type and the flame enters the furnace at one end at the top. Suitable baffles and flues are provided inside the furnace to insure a uniform distribution of the heat.

The pyrometer installation was furnished by the Hoskins Mfg. Co., Detroit. The pyrometer is of the continuous recording type. An indicating instrument also is supplied and suitable switches are provided so that the temperature of the several thermo-couples inserted in various parts of the furnace may be determined. These couples are arranged on each side of the oven with one additional in the middle.

An effort is made to keep the maximum temperature during the anneal 30 degrees Fahr. above the critical point where the structure changes for the castings that are being annealed. This point, of course, varies with the chemical composition of the castings. This temperature refers to the actual temperature of the castings and not to the oven temperature. By experiment, the Sivyer company has learned that it is necessary to carry an oven temperature 50 degrees higher in order to be sure the castings are being annealed at exactly the correct figure. This difference between the temperature of the oven and that of the castings varies for different ovens and must be determined by experiment in each individual case.

The Sivyer company's experience also shows that it does not make much difference whether the castings are brought up to temperature slowly or rapidly. Every effort, however, is made to maintain the soaking temperature at a constant figure. The care taken in this direction is indicated clearly by Fig. 8, which is a reproduction of the recording pyrometer chart for a heat of No. 2 ordnance steel.

As this chart indicates, the oven was heated rapidly, in about two hours, up to a point slightly above 1500 degrees Fahr. This chart shows clearly the AC_3 and other critical points through which the castings passed; these points are indicated by sudden changes in the temperature due to recalescence, or to the sudden absorption of heat.

As the chart indicates, the heats are maintained at the soaking temperature for about four hours after which the oven is cooled very slowly. Approximately 10 hours are consumed in cooling the charge down to 700 degrees Fahr. The pyrometer record does not cover this entire period since it is not necessary to keep track of the temperature closely below 1000 degrees. The main idea at this stage of the work is simply to prevent the castings from cooling too rapidly. When the temperature has been brought down to 700 degrees, this point being indicated by a test made by the indicating pyrometer, the rate of cooling is accelerated.

As previously mentioned, each anneal must contain castings of approximately the same chemical composition, the carbon being the determining element in fixing the temperature of the critical point. The heats, therefore, are grouped for annealing according to chemical composition and about eight heats are annealed at one time. After the castings are annealed they are ready for the final cleaning and inspecting. The annealed test bars are machined and the required physical tests are made under the supervision of the government inspectors. A standard tensile testing machine is employed for this purpose. When the tests are passed, the castings from the corresponding heats are sand-blasted and tumbled, using the equipment shown in Fig. 10. The Sivyer company has found it necessary to install a large amount of cleaning equipment on account of the large number of small castings handled. An effort is made to clean the castings in as thorough a manner as possible in order that the finished product may have an attractive and workmanlike appearance.

After the castings are finally sand blasted and tumbled, they are again presented to the government inspectors for individual examination, stamping and approval, after which they are ready to be shipped to the machine shop.

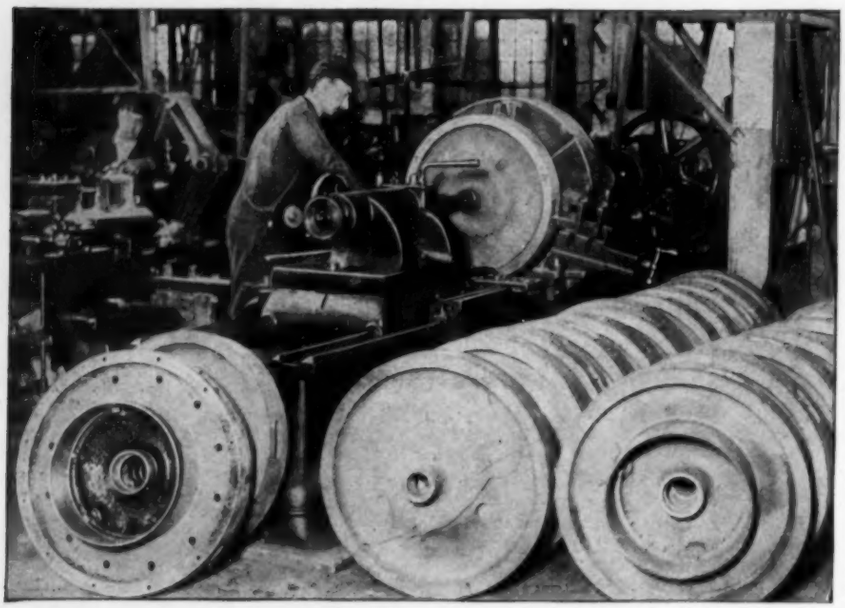
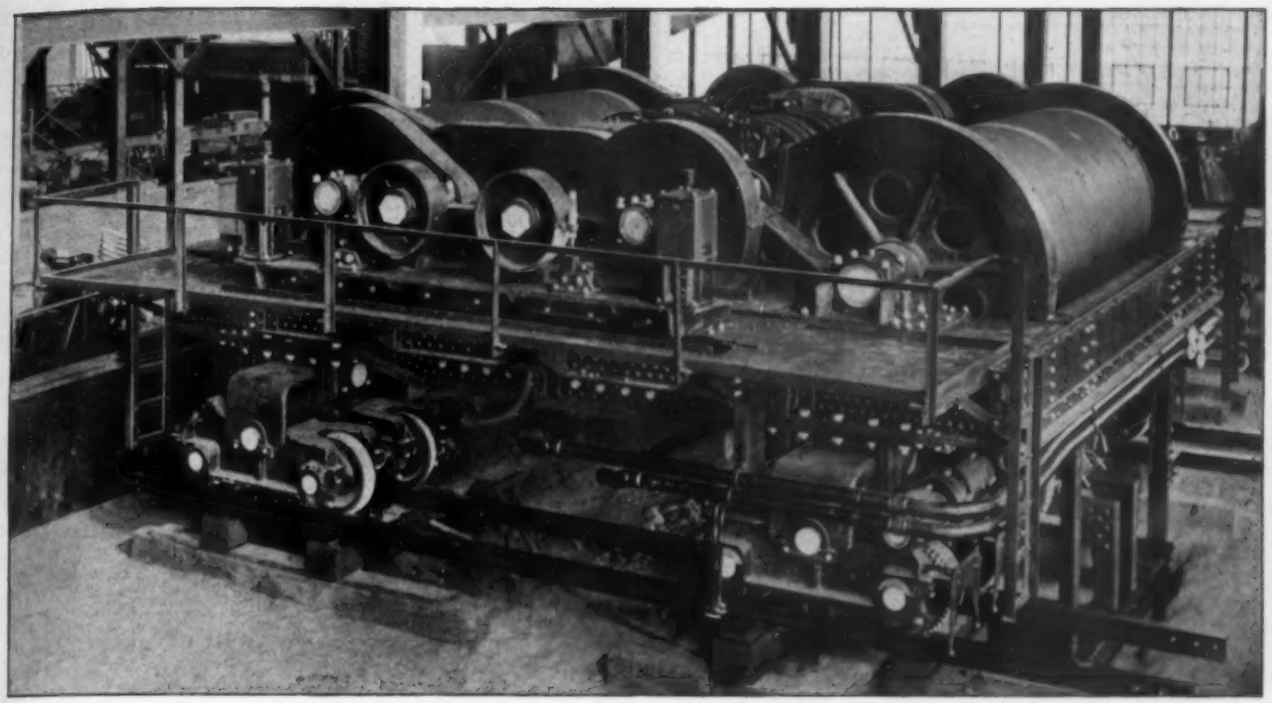


FIG. 13—ORDINARY LATHES ARE USED FOR MACHINING PLATE-TYPE MILITARY-TRUCK WHEELS

The facility with which plug switches may be used to make and break small currents at comparatively high voltages with safety, in addition to the feature of their small cost, has led to a widespread adoption of this accessory for use on both primary and secondary sides of constant current transformers in connection with arc and incandescent lighting. Recent improvements in the design of the switches have been announced by the General Electric Co., Schenectady, N. Y. The newer switches embody safety features which preclude the possibility of accidental contact with the switch when the plug is not in place. The single plug switch has been provided with greater insulation and the plug with a larger handle. The double plug switch follows the design of the single pull element in the use of tube insulation, porcelain and brass supports.

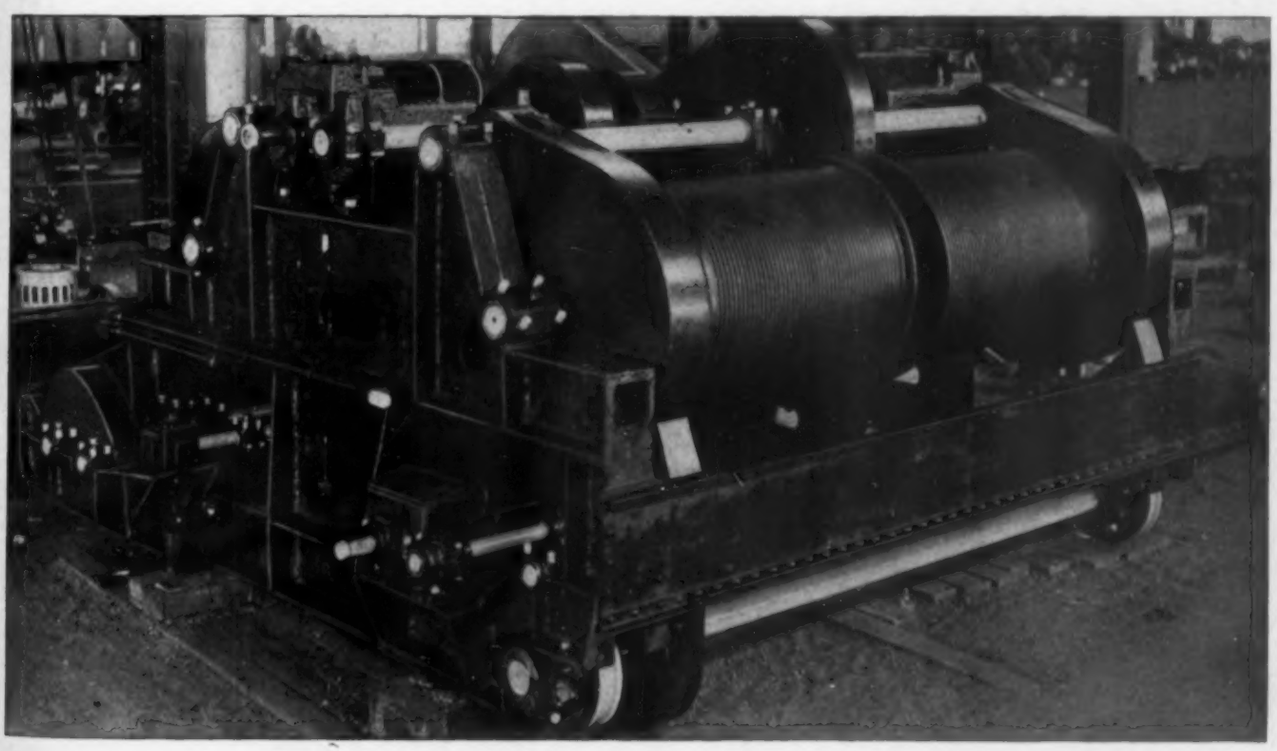


Main Trolley of 430-Ton Crane is of Double-drum Type

New Crane Sets World Record for Size

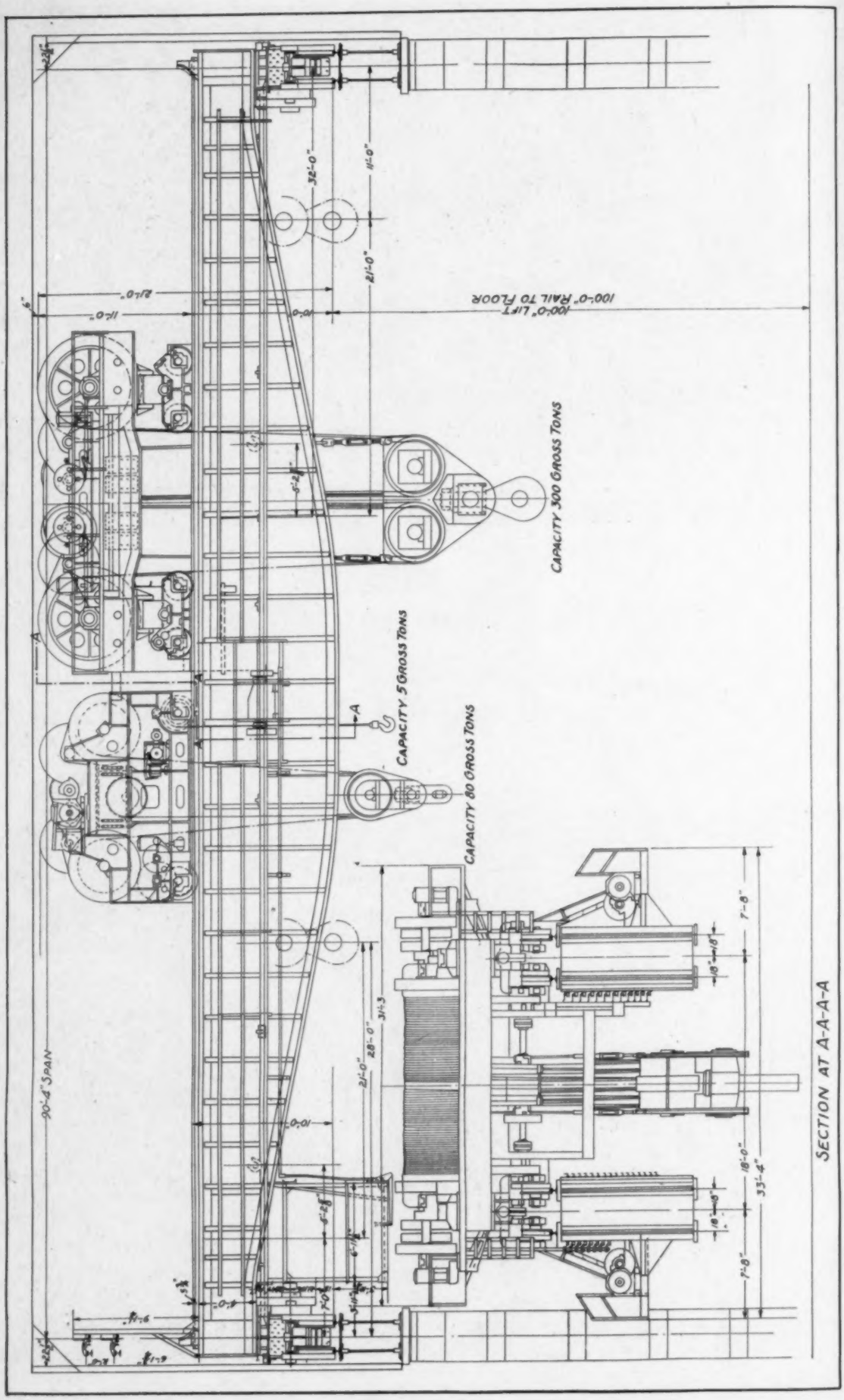
SIXTEEN loaded freight cars left the plant of the Alliance Machine Co., Alliance, O., a few days ago, carrying the component parts of the largest electric overhead traveling crane ever built. Despite its huge size and the unusual problems met in its design and construction, the crane was completed in nine months. It was built for use by the navy department.

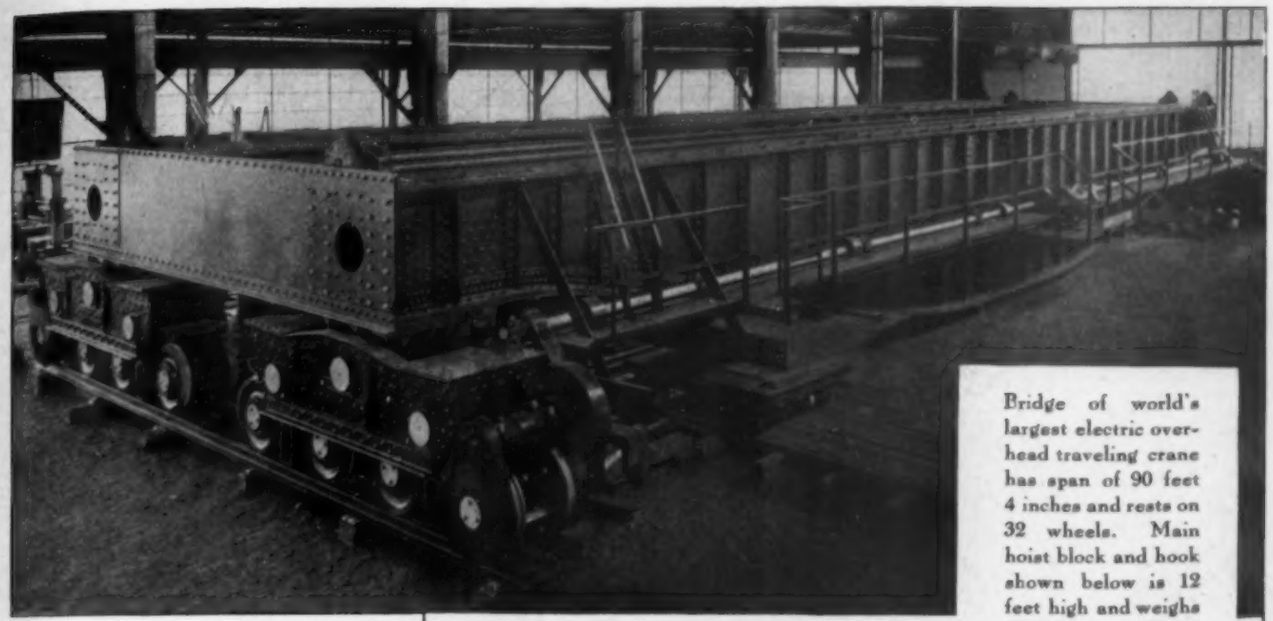
The immensity of the loads to be carried and the wide variations in the hoisting and lowering speed necessitated this hoist crane being especially designed. The main hoist has a lifting capacity of 300 gross tons; the first auxiliary hoist, a capacity of 80



AUXILIARY TROLLEY OF BIG CRANE ON ERECTING FLOOR

General Arrangement of Huge Crane and End View of Main Trolley





Bridge of world's largest electric overhead traveling crane has span of 90 feet 4 inches and rests on 32 wheels. Main hoist block and hook shown below is 12 feet high and weighs 37 tons.

gross tons, and the second auxiliary hoist a capacity of 5 gross tons, giving a combined lifting capacity of 385 gross tons, or 431 net tons.

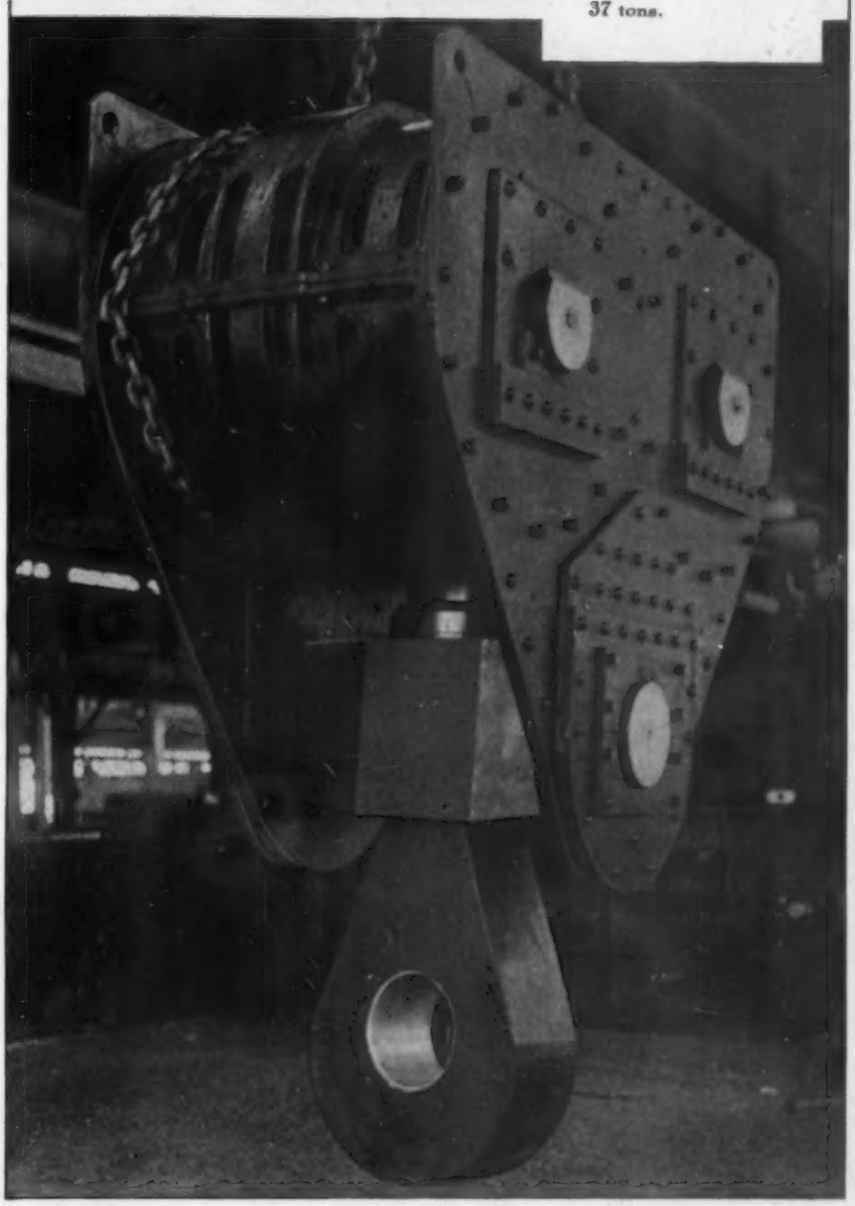
When installed, this huge crane will be in position above two 300-ton cranes. The latter are of the same general design with the exception that the main trolley will have only one drum. The latter cranes are now under construction in the Alliance plant.

The specification called for absolute accuracy of control, and to secure this, the main trolley has a single hoist with two drums and two lines of gearing. This design eliminates the possibility of any swinging movement being imparted to the load. The auxiliary trolley carries two hoists. The two trolleys are independent.

Control is Accurate

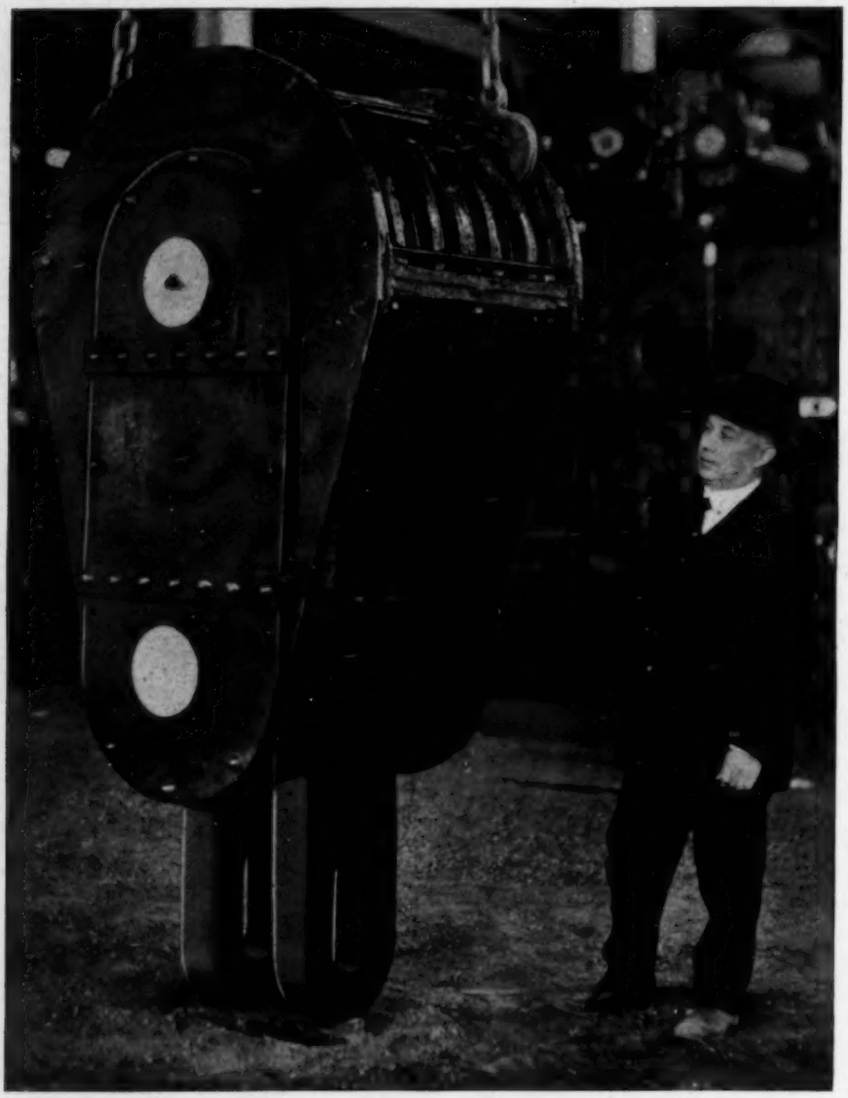
The main hoist is designed and arranged so that the operator can lower one-eighth of an inch at a time. Special control and braking apparatus was necessary to secure this accurate control of the load when lowering. Both dynamic and jackshaft braking are employed. The hoisting and lowering speed of the main hoist with full load is 12½ feet per minute. The hoisting apparatus is operated by two 200-horsepower motors. The use of two motors increases the safety of operation as in case of emergency one motor car take the full load for a short time. The motors are coupled to avoid any variations in the speed of hoisting or lowering.

The auxiliary trolley is of special design to meet the different speeds specified for the auxiliary hoists. These speeds vary from 45 to 2 feet per minute. A specially designed mag-



netically operated clutch is provided. Special gearing, giving a ratio of 19 to 1, is employed.

The span of the crane is 90 feet 4 inches. The span of the main trolley is 18 feet. The crane runway is 120 feet above the ground level, the main hoist hook coming to the top of the runway rail. The height of the crane from the top of the rail to the top of the hoist is 21 feet. The maximum lift is 100 feet. The cross travel on the main trolley is secured through an 80-horsepower motor, giving a speed of 45 feet per minute. A 30-horsepower motor controls the cross travel on the auxiliary trolley, giving a speed of 40 feet per minute. Two 50-horsepower motors are installed on the bridge giving a speed of 50 feet per minute. These motors drive independently.



AUXILIARY HOOK BLOCK

The trolley and bridge driving mechanisms also were especially designed to meet the conditions imposed by the unusual size of the crane. The trolley trucks are designed to oscillate in all directions. The trolleys are carried on four rails and through the use of special bearings, any oscillation is automatically taken care of so that the trolley is kept in alignment at all times. The bridge driving mechanism also is constructed in the same manner to take care of any deflection. The crane is carried on thirty-two 30-inch track wheels and is driven from all corners, two driving wheels functioning in each corner.

The runway has been constructed especially to meet the requirements of the crane. Two independent rails are provided on each side.

The problem of securing a maximum lift to the top of the crane rails involved considerable study. This feature was desired in order to hold the height of the runway down to a minimum. The problem was met by raising the compensating trucks and girders both on the trolley and on the bridge.

The distance from the bottom of the main hoist hook to the top of the hook block is 12 feet. The auxiliary hook is 8 feet high. The main hoist hook weighs 37 tons and is constructed of special forgings. The motors and controller system for the crane were furnished by the General Electric Co., Schenectady, N. Y.

Writes History of Steel

"Fifty Years of Iron and Steel" is the title of an attractive new book for complimentary distribution, which has come from the pen of Joseph G. Butler Jr., with the Penton Press, Cleveland, as the publishers. In the main, the new volume is made of the address under a similar title, presented by Mr. Butler before the American Iron and Steel institute at Cincinnati last October. In this address Mr. Butler presented in a narrative form and sequence, the marvelous development of the iron and steel industry covered by the span of his identification with the industry which in fact represents a period of sixty years. The unique and impressive feature of this recital is the fact that many historical events are related from personal experience or reminiscence. In putting his address in book form, Mr. Butler has embellished his intimate knowledge of significant incidents, by the portraits of those who have been distinguished both in the past and present development of the American iron and steel industry and by interesting reproductions depicting the early conditions of the business. There has also been added a chapter on the early use of iron and steel and a supplement containing brief historical reference to the formation and organization of the United States Steel Corp.

Mr. Butler's book adds another valuable addition to the contemporaneous historical literature of the iron and steel industry. Its greatest charm lies in the fact that the author writes from personal knowledge and contact with events and personalities which rank high in the development of the industry during the past half century. In putting his own experience and reminiscences in permantnt form, he has rendered a real service to the entire iron and steel industry.

The Brier Hill Steel Co.'s third blast furnace at Youngstown, O., is being completed as rapidly as possible and it is expected the units will be in operation in four months.

Must Maintain War Production

Labor Controversies Mark Black Spot in Nation's History Says President Vandervoort of Metal Trades Association—Unselfish Co-operation of Employer and Employed Essential—Taft Pleads for Hard-Hitting War Policy

SOON after the United States entered the war, a year ago, the National Metal Trades association held its first war convention. Then it was the association unanimously pledged its support to the government, adopting a resolution to place the plants of its members at the government's disposal and expressing a willingness to allow pending labor questions to lapse for adjustment until after the war. Last week, April 24 and 25, the association held its twentieth annual convention, the second war meeting, at the Hotel Astor, New York. In the year which had passed the members had been enabled to realize more clearly the important part the metal trades are being called upon to take in the conduct of the war, and had shared in the sacrifices demanded by war. There was a sterner note in this second meeting, an atmosphere of determination to see the war through to the bitter end, no matter what the cost. Labor conditions were considered, as usual, but this time with a view to securing the highest possible efficiency in the production of essential materials for the government. The association earnestly endorsed the policy laid down by the council of national defense "that employers and employes in private industry should not attempt to take advantage of abnormal conditions existing to change the standard they were unable to change during normal conditions."

Ex-President William H. Taft, at the annual banquet, comprehensively expressed the feeling of the convention when he cried, "Let's get it into our minds that three years is the time we must count for the rest of this war. Isn't it worth setting aside three years to make the world a place worth living in? We must have an army of 5,000,000 men, with the ships to transport them and the munitions to supply them. If this western drive has taught us anything, it has taught us that man power is going to win this war and we've got the men, if we only apply them. But we've got to do that. Thank God, though, now, we are beginning to get men into control who know how to get the things that must be accomplished, done. Stettinius, Goethals, Schwab (here the applause was thunderous), those are the men in whom our hope rests. But we ought not to lose sight of the great end. Indeed, I think we ought to have a creed which would recite, all of us, every time we meet in patriotic gatherings." And in slow, measured, but intensely fervent tones, ex-President Taft repeated the creed which he had drawn up for the guidance of the nation in this hour.

Inspired by the determination to win the war, the convention was a clearing house for many practical suggestions having a bearing upon war industry. The experience of manufacturers both in England and this country with women labor was studied. The use of various socialistic tendencies, and the spread of seditious theories as fostered by German propaganda were discussed. Helpful hints on plant protection were given by an authority.

President W. H. Vandervoort, in his annual address, emphasized that the lives and fortunes of those who are remaining at home during the war should be dedicated to the purpose of furnishing supplies which are necessary to the boys "over there" and said that in his opinion no organization could be of greater assistance to the country in this critical hour than the National Metal Trades association. After reviewing the setting in motion of the great machinery of war organization—draft, taxes, loans, red cross and so on—Mr. Vandervoort said:

"There remains to be cleared away the one great menace to our ultimate and complete success—labor controversies. That industry should have been held back during this first year of war by more than 3500 strikes, mostly in plants on war essentials, is a black spot on our nation's history. Had labor accepted the policy of the council of national defense as did the employers, this country would have been spared much of the industrial strife that has held back seriously the production so necessary to our winning of this war."

War Labor Policy Outlined

Here Mr. Vandervoort outlined the steps taken by Secretary of Labor Wilson, at the request of the President, to establish a common ground on which both employer and employe might stand for the balance of the war. The National Industrial Conference Board, representing employers, and the American Federation of Labor, representing labor, each nominated five representatives to constitute a commission for the formation of principles and policies to govern in the adjustment of all labor difficulties for the duration of the war. Each group selected a sixth member, the employers choosing William H. Taft and the employes Frank P. Walsh. "For nearly a month this commission struggled with the problem in a sincere effort to bring about that patriotic co-operation so necessary if we are to succeed in this great conflict," he said. "They fully realized the necessity for industrial peace. Both sides found it necessary to modify their opinions in order that the employers and employes might stand shoulder to shoulder in this fight for a common cause.

"This agreement, while not conceding to labor all its cherished industrial convictions, nevertheless preserves to labor all it has accomplished. It condemns the strike and the lockout as an un-American weapon in this, our national hour of peril. It affirms the principle

of the open shop. It preserves the closed union shop where it already exists and by the same token, the closed nonunion ship. It recognizes the right of men to organize themselves for lawful purposes. It prohibits coercive measures and all limitations on production. It recognizes the basic 8-hour day only as required by existing laws and not in any sense as an economic measure. It declares for the maintenance of existing safeguards, the rights of women in industry and the right of all to receive a living wage. The commission has provided for the necessary machinery for the administration of these principles in settlement of controversies. While this labor treaty can hardly be expected to eliminate strikes entirely, it is the belief that, backed by a strong public opinion, and the moral influences of the better elements among employers and employes, it will become effective.

"Thus briefly we have noted the conditions which make for industrial peace at this time, so necessary to the safety of the nation. You ask what should the employer and the employe do to win this war. There must be co-operation, real, unselfish co-operation, an appreciation of what our boys at the front are enduring and what the interruption of the flow of supplies and equipment, the products of our factories means to them. If it were possible, the first thing I would suggest would be that all of us forget that we are either employers or employes. The employers of this country are not at war as such, neither are the employes. Our country is at war and the primary interest of each of us in that war is in our capacity as citizens of the United States."

8-Hour Day Stationary

That the 8-hour day movement has not progressed in the metal trades during the past year was indicated by the report of Secretary Homer D. Sayre. Of those members reporting to the secretary, only 5.6 per cent are operating on a 48-hour weekly basis, while 94 per cent are working 50 hours a week or more, and 51.3 per cent are operating 54 hours a week or more.

The formation, growth and objects of the National Industrial Conference Board were described by Albert Greene Duncan, past president of the National Association of Cotton Manufacturers. In June, 1914, a group of 22 manufacturers and bankers held an informal meeting, at which the idea of such a board was born. The idea was worked upon for two years before the board was finally created in its present form. It consists of two delegates from each of 19 national manufacturing associations and is a co-operative board, acting as a clearing house for information and a forum for discussion of important topics. It is not a controversial body, but is organized with a definite set of principles, first to seek the truth underlying the important labor problems and second to publish the facts found in such investigation. One of its first duties was to answer the call of the council of national defense for a report on the relations of the government, labor and capital.

Makes a Stirring Address

"New Lamps for Old" was the rather enigmatic title of an inspiring address by James A. Emery, counsel for the council of national defense. This title was drawn from the incident in the story of Alladin's lamp, where the magician tempted Alladin's queen into parting with the old lamp by offering a nice shiny new one in exchange. In the same way, Mr. Emery pointed out, the soap-box orators and others of their ilk, the American Bolsheviki, are trying to persuade the American public to surrender the institutions, ideals and principles which have grown up under our democratic form of government. This government, he said, has existed for 140 years, a period longer than the present forms of government in England, Germany, France, or any other country in the world. The people, he pointed out, are benefiting from hygenic measures to protect their bodies from germs of disease. In the same way, he said, why not protect their bodies from the vices of false thought?

"You cannot cure men's acts unless you cure their thoughts," he added. "If, through apathy, indifference or cowardice, manufacturers fail to use their sphere of influence, in the plant, in the office, in the home and socially, to drive out false thoughts, they are not doing their duty as responsible citizens."

He said that German propoganda was more dangerous than German artillery and more accurate than German riflemen, that German propoganda had broken down the resistance of two great nations, Russia and Italy, and that we must guard against such propoganda in this country.

The soap box orator, he said, touches his auditor in two ways. In the first place, human nature is such that one does not mind listening to an appeal to divide someone else's property with him. In the second place, the soap box socialist explains to his auditors, who are generally failures themselves, that their failure is due to the fact that some one else kept them down. This describing of their failure in terms of someone else's success, appeals to the vanity of the failures, forming fertile ground for the American Bolsheviki. Every socialist is a missionary, Mr. Emery continued, not only believing his own creed, but teaching it to others. In the same way, the future of American institutions lies in the hands of true Americans, who must maintain our traditions and keep burning the altar lamps of the public mind. Citizens, especially citizens with property, must retain a sense of trusteeship and guardianship. They must not stand trying to push back the currents of reform, but must lead such current in the right direction. The sending of 3,00,000 or 5,000,000 men to the front will be a tremendous influence, Mr. Emery said, in the upholding of our institutions and ideals after the war. Those men who are defending with their lives these very ideals will not be quick to sacrifice the old lamps for the new. They will want some voice in saying what kind of world they will live in after the war and will be an important factor in determining the course of social reconstruction. And the friends and relatives of those men who are at the front will feel more and more intensely as time goes on, against the efforts of those who are putting obstacles before the government in its war efforts.

"Woe unto the men or the influence that stands in the way of supplying those boys in France with the munitions and materials they need," he concluded.

Discusses Plant Protection

Edwin Leigh, of the federal military intelligence bureau, gave the convention one of its most interesting half hours, in a discussion of "plant protection," a subject of vital importance in these times. Mr. Leigh said that the bureau is maintaining offices in 18 industrial centers, to advise and aid private manufacturers to the best possible protection

Taft Writes Creed for Good Americans

I believe that the cause of the United States and the allies is a just cause and makes for righteousness.

I believe the kaiser and the Potsdam gang cannot make a treaty we have any right to approve.

I believe we do not discharge our duty to ourselves and the world till we have fought this war to a victory over the kaiser and the Potsdam gang and the German government as it is at present constituted.

I believe all our energies during the next three years should be devoted to raising an army of 5,000,000 *men and the ships necessary to transport them to France, and the supplies necessary to them to fight this war.*

I believe we are going to win this war.

of their works. He said that, although at the beginning of the war many manufacturers had requested military protection, the military authorities were opposed to this policy and urged instead that each plant arrange its own protection. Mr. Leigh explained that the selection of an efficient chief of protection, having under him a corps of good alert private watchmen. These men, he said, are of really more benefit to a plant than the military, for they become accustomed to their surroundings and are quick to notice anything unusual, whereas soldiers are continually being transferred. Mr. Leigh laid special emphasis on the necessity for good lighting and fire prevention, mentioning that it has been found that 70 per cent of industrial fires occur between the hours of 6 and 9 p. m., or approximately the time employes leave the plants. He said this was due to leaving burning torches and unextinguished fires, or throwing away matches as they "light up," leaving the works. Mr. Leigh also gave some interesting pointers on "counter-espionage" work, which were received by the members with much interest. He went into some detail in the description of seditious and enemy activities and said that the services of the federal bureau were at the disposal of manufacturers, without charge. He emphatically discouraged the policy of some manufacturers in placing the protection of their plants in the hands of private detective agencies. He intimated that in some cases private agencies are "planting" bombs and stirring up hysteria as a means of promoting their own business.

William H. Barr, president of the National Founders' association, discussed the "present socialistic trend." Reviewing the present labor situation, he said that industry has seen wages doubled, trebled and even quadrupled, while efficiency has decreased and greater arrogance than ever is being shown by organized labor. He traced the transition of labor from domestic labor in the middle ages to the formation of guilds, to join which the worker had served an apprenticeship of seven years. He pointed out that the final downfall of the guilds was due to the fact that they failed to live up to their promises and their principles as originally outlined, and said that in the same way, modern organized labor, through the restrictions of trade unions, is undermining the government. A continuation of such policy, he said, will result in the elimination of the trades unions. There has been a distinct drift since the war began toward socialism, he said, not only on the part of soap box orators but of theorists, who have made fortunes and now talk socialism, and by public men who aim at notoriety. He said the professors of some universities have socialistic leanings and that hardly a state capital in the country that does not have some professors in charge of important departments, while at Washington, "you stumble over them."

Recounts England's Labor Problems

"Liberal England's Message to America" was delivered to the convention by S. K. Ratcliffe, lecturer of London university. He went into detail into England's experience with labor during the war, remarking that England's problems were different from America's, for English labor is a more coherent force, comprised of one race and speaking one language, while American labor is comprised of many races with many different ideals. In England, he said, it was easier for the trade union leaders

JOHN W. O'LEARY
Elected President of National Metal Trades Association at Its Annual Meeting

to swing their members, than in this country. He told of how British labor had surrendered rules and benefits secured after more than a half century of struggle, receiving in return the government's pledge of restoration of prewar conditions after the war. He suggested, however, that this pledge may be difficult of keeping, for the war is having industrial by-products which are changing the outlook for the future almost monthly. He said that after the war the policy of "restricted output" by labor will be impossible; that both employers and labor will see the necessity for making production an efficient and product as large and good as possible, for there will be sharp competition in the world's markets.

A paper by W. A. Viall, of the Brown & Sharpe Mfg. Co. was read. This company represents the large class of employer that had not employed women in manufacturing prior to the war, but under the pressure of present conditions felt itself compelled to resort to measures that would help its output. It possessed a plant built and organized for men only and had to rearrange its shops and adapt its organization to employ women. During 10 months the company successfully placed 800 women at productive work. Mr. Viall continued:

"Much could be said in detail as to the way that they are successfully working on various kinds of work, but I shall enumerate them only as follows: Inspection; grinding, cylindrical as well as tool; lathes; screw machines, hand and automatic; small planing machines; hand lathes, doing polishing and hand tooling work; gear cutting machines; blue print room; stamping; filing; assembling of small tool parts and general bench work. All of these classes are well within the physical power and ability of the average woman."

H. E. Miles, chairman of the section on industrial training for the war emergency of the committee on welfare work, advisory commission, war industries board, discussed the question, "An abundance of efficient well-paid labor—how to get it?" In this connection he stated that it was the duty of employers in this war of machinery not only to make machines, but to make machinists to make those machines. He described, with lantern slides, the employment of women in England's war industries to the present number of 1,250,000, in all classes of work.

The association adopted a resolution to be sent to the President, Secretary McAdoo, the respective committees of the senate and house and to the congress of the United States stating that whereas the financing of industries doing war work must be protected, that measures be taken toward the payment of income and excess profits taxes in installments, instead of one payment. Another resolution adopted was that the association pledge its official support to the national war labor board as created by the President.

The convention concluded with the election of officers. J. W. O'Leary, of the Arthur J. W. O'Leary Co., Chicago, was chosen president, succeeding W. H. Vandervoort. Other retiring officers were re-elected, as follows: First vice president, Murray Shipley, the Trailmobile Co., Cincinnati; second vice president, H. W. Hoyt, Great Lakes Engineering Works, Detroit; and treasurer, F. C. Caldwell, H. W. Caldwell & Son Co., Chicago.

About 325 delegates were registered at the convention. The association's membership now is about 720.

Call On Yards For Huge Tonnage

Goethals Understood to Have Told Schwab Overseas Military Movements Require 10,000,000 Tons of Shipping Delivered in 1919—New Director General of Ship Program Against Changes in Construction Plans

WASHINGTON, April 30.—Charles M. Schwab had hardly been in office a week as director general of the Emergency Fleet corporation before Maj. Gen. George W. Goethals, one of his predecessors and now director of traffic, supplies and storage for the army, laid before him and other officials of the corporation and the shipping board the war department's plans for transporting men and munitions to Europe at a speed which will require 10,000,000 tons of shipping delivered in 1919. Of this huge tonnage, it is believed 8,000,000 tons will be of standardized steel construction, requiring nearly 3,000,000 tons of plates and structural shapes.

Official confirmation of this tonnage is lacking, but estimates based on statements by Edward N. Hurley, chairman of the shipping board, and the efforts of the war department being made to rush as many men as possible to the front gives grounds for the belief that the figure is approximately correct. As a means of speeding production, Director General Schwab has declared that as far as practicable changes in present ship plans would be abandoned and that every available facility for rushing construction of vessels would be utilized. This news is expected to be heralded with great acclaim by shipbuilders and fabricators who before, have had plans and specifications shifted on them without notice.

While General Goethals was telling the shipbuilding heads what his department needs and expects, especially for transports and refrigerator ships, the Fleet corporation wasted no time in awarding contracts for 22 new steel freighters of a total tonnage of 204,600 tons. These are to be of the Isherwood type, that being built by the United States Steel Corp.'s shipbuilding subsidiary. Twelve of these are to be of 9600 tons each and the other ten 9400 tons, the Carolina Shipbuilding Co., Wilminton, S. C., and the Union Construction Co., San Francisco, participating in the awards. The Whitney Bros. Co., Superior, Wis., was given contracts for four 150-foot sea-going tugs and the Wilson Shipbuilding Co., Astoria, Oreg., orders for three 3500-ton wooden ships. Announcement was also made that the Liberty Shipbuilding Co. had begun construction of the government's first concrete shipbuilding plant, at Wilmington, N. C., to be completed in six weeks for construction of at least eight concrete ships, tankers, of from 3500 to 7000 tons each.

Many New Awards Made

Mr. Schwab has begun a tour of the leading shipyards of the east and so far has been favorably impressed with the progress being made both in the completion of yards and in the construction of ships. Mr. Schwab realizes what the general public has overlooked, that the vastness of the task confronting the Fleet corporation, and himself now, has to have a beginning and that the building of the ways must come before vessels can be constructed. However, the reports which have been coming in of "new record" launchings from various shipyards, particularly along the Pacific coast, and the selection of Mr. Schwab to see that even newer records are established, are believed to be appeasing the public of the long delay in "getting action."

The actual figures contemplated in the 1919 program were stated by P. A. S. Franklin, chairman of the ship control committee, at a dinner held here at which General Goethals and shipping board and flee corporation officials were present. The guests included Chairman Hurley, Director General Schwab, Charles Piez, vice chairman; E. F. Carry, director of operations; Dean Gay, director of statistics and planning; Mr. Franklin, John A. Donald, Bainbridge Colby and Charles Page, members of the shipping board; Sir Connaught Guthrie, England's representative on the ship control committee; C. D. Mallory, member of the committee; Charles Day, of the shipping board; General Goethals and his aide, Colonel Hines.

The shipping board's official announcement of the conference said it was "the most important conference since the shipping board was organized"; that "everyone agreed that speed in construction is now the essential thing", and that "plans were made for speeding up the construction of refrigerator ships so that our armies on the other side can be supplied with fresh meats". General Goethals strongly urged speed in delivering this type of vessel as well as army transports as rapidly as possible.

Ryan Expected to Speed Up Air Program

WASHINGTON, April 30.—Aircraft production is expected to go forward with renewed vigor, now that John D. Ryan has been made director of that branch of the army's work. While it is admitted that Mr. Ryan knows little of airplane manufacture, it is pointed out that his administrative ability will force this part of the war program to "deliver the goods", as Charles M. Schwab is expected to do in regards to ships. Mr. Ryan's appointment is another answer of the government to the universal demand that business men be given control of the government's war machine.

It is too early for Mr. Ryan or anyone else to say what he is going to do in putting out the planes so badly needed by the American forces. He supplants not only the signal corps, which had the work directly in charge, but also succeeds the aircraft production board of which Howard Coffin was chairman. No blame attaches itself upon Mr. Coffin personally in the failure of the aircraft program to meet expectations. He, like many others, has been a victim of red tape, his friends say, but like General Goethals and others who have been removed from one job only to be given another, will find his stride in some other field of government service.

Mr. Ryan, like Mr. Schwab, is not to be held back by red tape. The military movements of the work, controlled by General Squiers, chief of the signal corps, now have been removed and Mr. Ryan is free to employ the business experience he has gained as president of the Anaconda Copper Mining Co. and as director

of the American International Corp., the United Metals Selling Co., the Chicago, Milwaukee & St. Paul railroads and some half dozen other business concerns. His lack of intimate knowledge of aircraft manufacturing is believed to be more than offset in other ways.

Under the existing laws, General Squiers still is the legal head of the aircraft production program, but will not interfere with Mr. Ryan's directions and will devote his time only to strictly signal corps duties. W. C. Potter, who has been chief of the equipment division of the corps, continues in that capacity and Brig. Gen. William L. Kenly, an artillery officer fresh from France where artillery and airplanes are closely associated, has been named chief of the division of military aeronautics, created under the reorganization. He will manage operation of the aircraft produced by Mr. Ryan and equipped by Mr. Potter.

This reorganization meets the recommendations of the senate military affairs committee and is expected to receive legal changes which will make the regime of Mr. Ryan absolute. The Overman bill may cause this.

To Curtail Ferro Imports

WASHINGTON, April 30.—The second list of restricted imports proclaimed by the war trade board in conjunction with arrangements with the shipping and other war functioning boards of the United States is expected to be the means of conserving another 157,000 tons of ships annually, increasing the conserved import tonnage to 1,507,000, of which arrangements were made some weeks ago for saving 1,350,000 tons. The new restrictions become effective May 13 allowing imports, under license, of molybdenum and ferromolybdenum from Canada and Mexico; ferromanganese and spiegeleisen, overland from Canada and Mexico or by lake from Canada; and lead and magnesite under like provisions.

Ferromanganese imports last year amounted to 45,381 tons, a decline of 45,547 tons from 1916, and this year, with the government's agitation for utilization of spiegeleisen and home produced ores, the imported tonnage likely would have been less without restriction being placed. Exportation of ferromanganese, which amounted to only 5468 tons in the last half of 1917, is expected to reflect the oncoming curtailment by decreasing or disappearing entirely.

On last year's basis of 145,000,000 pounds of lead imported, only 19,000,000 pounds will be curtailed. In 1917, Mexico supplied the United States with 115,000,000 pounds of lead ore and bullion. Canada furnished nearly 12,000,000 pounds. Neither of these tonnages likely will be affected by the restrictions, but the 19,000,000 pounds received from Chile and other countries will materially be reduced. Magnesite imports last year reached nearly 8,000,000 pounds, as against 18,500,000 in 1916.

In order to still further increase the vessel tonnage available to pressing military needs, a third list of import restrictions is in process of formation. Those interested in the lines of trade which it is proposed to limit now are being called into consultation.

May Ship New England Coke

WASHINGTON, April 30.—The plan of the fuel administration to make New England a coke zone to supply its own needs now is said to be altered to permit of coke shipments into New England, but still to exclude outgoing shipments. This is believed to be made in an effort to force a reduction in the price now being paid for by-product coke in these states. This price is $13.45, f.o.b., Everett, Mass., the location of the New England Gas & Coke Co.'s plant, the only coke producer in that section of the country. It has been demonstrated to the administration that barge hauls by way of Long Island sound are not practicable. No official orders have yet been placed in this or the McKinney Steel Co. coke zone proposals. Other zoning arrangements will be made.

Further changes in coke prices were announced by the fuel administration last week, effective as of 7 o'clock a. m., April 26. The new prices are:

Coke made at Coalmont, Tenn., $7.25, furnace, and $8.25, 72-hour selected foundry; coke from coal in the Pratt seam, Ala., $8, furnace, and $8.75, 72-hour selected foundry; coke made in Marion and Harrison counties, W. Va., $6.25 and $7.25; in Barbour and Randolph counties, W. Va., $6.75 and $7.75; and coke made in New Mexico, $8.50 and $9.50.

Export Valuation in March Increases Heavily

Washington, April 30.—The country's export business in March showed a decided improvement over the previous months, according to figures announced by the bureau of foreign and domestic commerce. They increased nearly $120,000,000 over February, reaching $531,000,000, and sending the nine months' total up to $4,394,000,000, which is $243,000,000 less than in the same period last year. Imports also increased, gaining $34,000,000 over the February total of $208,000,000. The nine months' import total, however, in larger than that of a year ago, amounting to $2,084,000,000, an increase of more than $225,000,000. Formerly it was customary to blame the falling off in foreign trade to action of the war trade board on one hand and the submarines on the other, but in March, evidently, some other explanation is needed.

Capital Odds and Ends

WASHINGTON, April 30.—The interstate commerce commission last week made two rulings concerning industrial railroads. One was that placing of cars by the Chesapeake & Ohio railroad within the plant enclosure of the Virginia Portland Cement Co., Fordwick, Va., constitutes delivery under the line-haul rate, and that any allowance to the company's own line, the Virginia Portland railroad, for spotting cars after the first placement is unlawful. The other was that the Central Railroad Co. of Indianapolis, providing only trackage for 20 industrial plants, cannot be made a party to the second industrial railways case. This latter line originally was built by the Indianapolis Rolling Mill Co. and later was owned by the Premier Steel Co.

* * *

Pig iron production in Sweden in 1917 reached 837,184 tons, 88,088 more than in 1916. Iron ore exports aggregated 5,702,808 tons, a gain of 135,184 over the year before. There was a decrease of 77,366 tons of various kinds of iron exported, the total being 495,701 tons, and imports of iron fell to 102,006 tons from 303,885 in 1916.

* * *

The war industries board has passed resolutions to discourage construction of public buildings and all new undertakings not essential to or not contributing directly or indirectly to the winning of the war. Such activities need labor, material and capital urgently needed for war work. The board announces that it will withhold priority assistance from such projects.

* * *

The David Kaufman & Sons Co., Elizabethport, N. J., has complained against the Pennsylvania, the Central

Railroad of New Jersey and the Huntington & Broad Top Mountain Railroad & Coal Co. that the rates on mill cinder and roll scale from Elizabethport to Earlston and Saxon, Pa., are unjust, and asks that the interstate commerce commission lower the maximum rates.

* * *

Business men and manufacturers are being appealed to by the bureau of foreign and domestic commerce for suggestions which may be noted in the bureau's proposed reclassification of import and export statistics. Export statistics are compiled from export declarations and import figures are drawn up in accord with tariff classifications. These points should be followed in making suggestions, the bureau says.

* * *

The Nashville Bridge Co. has filed a petition with the interstate commerce commission for reparation of $33.54 as overcharge on a shipment of 21,600 pounds of bridge steel from Nashville, Tenn., to the W. T. Young Bridge Co., McCarley, Miss. The railroads charged at a rate of 35.5 cents per 100 pounds and the Nashville company claims the charges should have been based on a 22-cent rate.

* * *

The Baltimore & Ohio railroad seeks cancellation of the rate of 29½ cents on tin and terne plate from Elwood City, Pa., to points on the Maine Central railroad, also cancellation of rates on iron and steel rails from Gary, Ind., to Hamilton, O., and on iron and steel articles from Hicksville, Hamilton, Willard, Deshler, North Baltimore, O., Albion, Gary, Sycamore, Wellsboro and certain points in Indiana, to points in Illinois, Michigan, Ohio and Ontario.

* * *

The fuel administration has exempted the refractory brick industry from an order curtailing brick and tile companies in the use of coal and other fuel. Fifty per cent restrictions have been placed upon manufacturers of face, common and paving brick, roofing, floor and wall tile, terra cotta and sanitary ware; 25 per cent on sewer pipe and drain and hollow tile, and 15 per cent on stoneware, except those plants producing crucibles for chemicals, etc.

* * *

The department of agriculture has been notified by the implement manufacturers of the northwest that there is vital necessity of farmers ordering their farm equipment at once. The manufacturers say there is plenty of machinery but shipments and supplies cannot be handled promptly for rush orders because of transportation troubles, and that shipment now to transfer houses would be inexpedient without some knowledge of the farmers' requirements.

* * *

Ill will may be created in Chile against firms in the United States because of their failure to notify merchants of their inability to deliver goods or of delays in shipment, John R. Bradley, consul at Punta Arenas warns. He suggests that all exporters adopt a rule to acknowledge receipt of orders at the same time giving information as to the part of the order which may be shipped at once, the part which may be delayed and estimated time of delay, and the part which cannot be delivered at all.

* * *

A resolution asking that the federal trade commission be authorized to investigate the production of farm fertilizers, tools, implements, utensils, machinery and equipment, has been introduced in congress by Senator Hoke Smith. The investigation would be as to the number of plants in the United States, their capacity, available supply of raw materials, increased cost of production, prices and profits now as compared with the three years preceding the declaration of war, and whether or not they are running to full capacity.

Urge Gear Standardization

American Gear Manufacturers in Convention Discuss the Necessity of Standard Methods

STANDARDIZATION in the gear manufacturing industry was emphasized at the second annual convention of the American Gear Manufacturers' association, held recently at White Sulphur Springs, W. Va. Gear manufacturers were urged to fall in line with other industries, which have adopted standards that are proving not only of value to themselves, but to others, but to adopt standards of their own.

B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, R. I., who is chairman of the general standardization committee of the association, presented a report on the work which is being done by the committee.

"There is in the hands of our members enough data of a scientfice nature, which if brought together and analyzed would form the nucleus of a respectable library of standards," the report reads. "One of our first duties should be to collect these standards and data, and from them make revisions of the standards to suit all conditions and develop others."

The report further stated that private standards of merit will lend themselves to general adoption easier than some new ones, and therefore in starting out in this work, those standards already in existence should be accepted.

During the past few years bevel gears have been highly developed due to a great advance in machinery for producing them and formulas for calculating the dimensions of the gears. Many such gears are now being cut with rotary cutters, and the committee impressed the fact that some though must be given to the proper cutters to be used.

Any standard adopted for the production of spur gears must be one that in no way conflicts with the present method of producing them, as this gear is the one most used and has received the most consideration.

Worm gears are now being used to transmit greater powers than was thought possible previously, but even now the design is not based upon complete analysis. A standard specification sheet, where all points will be considered, was recommended.

Standardization was urged for herringbone gears which have recently reached their greatest development and which to perform their work properly must be made extremely well; for sprockets, and for gears made of materials other than metal.

The best and most duable gears are those which are properly heat-treated or hardened, and if standard methods can be developed for handling the various steels, every manufacturer will benefit.

The report ended with a request that members send in suggestions to the various committees, as the standardization work, to be a success, depended upon the co-operation of all.

Routine matters were disposed of early at the convention. At the second session, officers were elected. F. W. Sinram, Cleveland, vice president of the Van Dorn & Dutton Co., was re-elected president. H. E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J., was elected vice president, and Frank D. Hamlin, Earle Gear & Machine Co., Philadelphia, was elected secretary-treasurer.

On the last day of the convention, J. H. Dunn, R. D. Nuttall Co., Pittsburgh, presented a paper on "Uniform Cost Accounting". F. G. Hoffman and John Edgar of the Barber Coleman Co., Rockford, Ill., presented a paper on "Hobbs and Hobbing Machines". "Hardening and Heat-Treating of Gears", by C. R. Poole, Frost Gear & Forge Co., Jackson, Mich., is given at length on page 1110 of this issue.

The meeting as a whole was a most successful one. The work accomplished, centered especially about standardization which was given an impetus that promises to be of great benefit to the industry. The association will meet again in September, the time and place to be selected later by the executive committee.

Obituaries

CHARLES J. DONAHUE aged 47, who for seven years was assistant vice president in charge of sales of the American Locomotive Co., New York, died recently at his home in New York, after a long iliness. After serving the Lake Shore & Michigan Southern railroad in various capacities, he was appointed secretary to W. H. Marshall, president of the American Locomotive Co., in September, 1908, and in two years was promoted to the position of assistant vice president in charge of sales. From it he retired in July, 1917, to form a company to handle railroad supplies, but ill health prevented.

James H. Slade, aged 27, erecting engineer for the Bartlett-Hayward Co., Baltimore, died April 25 at his parents' home, New York City.

James D. Swindell, president of the American Furnace & Machine Co., Pittsburgh, died at his home in Pittsburgh recently.

George Windsor, who for many years held executive office in the Farist Steel Co., Bridgeport, Conn., died suddenly in that city, April 23, at the age of 58.

Frank E. Vandercook, well known inventor of Waterbury, Conn., died April 24 in that city, aged 61 years. Among his inventions are a pin-making and chain-making machines.

Charles Francis Proctor, president of the Morandi-Proctor Co., Watertown, Mass., manufacturer of cooking apparatus, died recently at his residence in that city, after a brief illness.

Edwin O. Wood, assistant to William C. Durant, president of the General Motors Corp., and treasurer of the Chevrolet Motor Co., New York, died April 23, at Pasadena, Cal., aged 57.

Charles I. Dailey, assistant to the general superintendent of the American Steel & Wire Co., died at his home in Pittsburgh, April 23, after a continuous service with that company of 35 years. He was 62 years old.

Harrison M. Angle, aged 51, who was secretary of the Metal Block Corp., and president of the American Wood Reduction Co., Chicago, died recently at the home of his father-in-law at Evanston, after an illness of several weeks.

Capt. Harry H. Talon, one of the best known mining men on the Masabi range, died recently at Hibbing, Mich. He was a native of Ishpeming, Mich., and began his mining career as an employe at the Lake Angeline mine of the Cleveland-Cliffs Iron Co.

Thomas Dimond, at one time president of the Thomas Dimond Iron Works, New York, died at his home in that city, April 22, aged 64. Recently however he has been president of the Dimond-Apperson Automobile Co. He was a colonel of the seventh regiment veteran's association.

Charles B. Stanley, who for the past 15 years has been secretary and treasurer of the Stanley Rule & Level Co., New Britain, Conn., died in a New Haven, Conn., hospital, April 20, of heart trouble. He was taken ill on his way home from Pinehurst, N. C. The company was founded by his father, the late Augustus Stanley, with others.

Thomas F. Meek, prominent for many years in foundry circles, who for the last three years has had charge of the steel foundry of the Ford Motor Co., Detroit, died at the Ford hospital in that city recently at the age of 50. Ill health which followed a nervous breakdown several years ago prevented his recovering from an attack of pneumonia.

William Lunney, manager and superintendent of the Hygeia street plant of the Bladwin Chain & Mfg Co., Worcester, Mass., died at Rutland, Mass., recently, after an illness of five weeks. He was 45 years old superintendent of the main plant on and had gone to Rutland to regain his health. For 10 years he was Chandler street before the Hygeia street branch was established.

William Wattie, aged 76, who for 30 years was superintendent of the Crompton & Knowles Loom Works, Worcester, Mass., died at his home in that city April 24, after an illness extending over a period of several weeks. He retired from active work in 1910 and since then has served in an advisory capacity as a member of the company's advisory committee. Mr. Wattie's inventive genius contributed over 60 different patents for textile machinery manufacture. Practically his entire life was devoted to the manufacture of machinery.

George Windsor, president and treasurer of the Bridgeport Steel Co., Stratford, Conn., died at his home in Bridgeport, Conn., April 23, following an attack of pneumonia. He was 59 years old and a native of Jersey City, N. J. He located in Bridgeport in 1880, becoming identified with the Frary cutlery works. Later he became associated with the Farist Steel Co., and was for many years its secretary and treasurer. After the company's dissolution a short time ago, he organized the Bridgeport Steel Co., and continued as its head until his death.

Edward L. Warren, who after 40 years of continuous service with the Washburn & Moen Mfg. Co., and its successor, the American Steel & Wire Co., Worcester, Mass., retired on a pension in 1905, died at his home in Worcester, April 24, after a stroke of paralysis which followed a long illness. He was 79 years old. Mr. Warren had charge of the installation and maintenance of the electrical equipment and was emergency surgeon before the establishment of private hospitals in the works. He also invented numerous improvements in appliances for wire manufacture.

Ambrose Beard, who was at one time manager of the Cambridge Iron & Steel Co., now the Guernsey works of the American Sheet & Tin Plate Co., Cambridge, O., died recently at his home in Detroit, aged 58. Prior to going to Cambridge, he was secretary and treasurer of the Morton Tin Plate Co., and later sales manager of the West Penn Steel Co., Brackenridge, Pa., which position he left to engage in the selling of sheet steel in the Michigan automobile territory. He was the son of the well known British ironmaster, the late George Beard, past president of the West of Scotland Iron and Steel institure of which his son, Herbert Beard, now is president. Another son, Thomas Beard, holds an important position with the Lake Erie Iron Co., Cleveland.

Prepare Bolling Tribute

As a brief testimonial, a resolution of sympathy was passed at the meeting of the aircraft board of the United States held in Washington, April 23, and sent to the family of Col. Raynal C. Bolling, who was killed by the enemy on a French battlefield in the performance of his duty. He was a member of the aircraft production board and rendered valuable service to his country as a member of a mission to Europe to negotiate important military matters between the United States and allied governments.

Britain Uses Iron Board As Model

Plan of Midland Iron and Steel Wages Board in Establishing and Maintaining Amicable Relations Between Capital and Labor Generously Followed—Standing Committee Settles Disputes—Official Intervention Unnecessary

(Staff Correspondence)

BIRMINGHAM, Eng., April 10.—Special attention to the recent proceedings of the Midland Iron and Steel Wages board, England, shows that the British iron and steel trade has very largely become the model for all other British industries in regard to the friendly relations of capital with labor. Americans will be familiar by this time with the two consecutive reports of the Whitley committee which has been seeking to give a new lead to British industry in establishing friendly and practical relations between capital and labor The fact was made known at this meeting held in Birmingham, March 18, that the experience of the Midland board probably had more than anything else to do in directing the minds of the committee as to the remedies to be generally recommended. Mr. Macpherson pointed out that when the interim report of the committee on industrial councils was issued by the reconstruction committee 50 manufacturers of pig iron and finished iron and steel sent a signed letter to the committee describing the working of the board, and pointing out that it had existed for 40 years, and that although an independent president had been elected with the special duty allotted to intervene in case of employers and workmen not being able to agree on any subject, he had not been required to act in that capacity in 22 years, so that the position was practically a sinecure. The standing committee of 16 members representing the whole area was almost invariably able to settle disputes. But, apart from this, there was an organization in each works for the settlement of difficulties and this organization or the standing committee was so efficient that only on rare occasions was the entire board called together. The letter continued: "There has been no strike during the history of the board; employers and employed have enjoyed peace for over 40 years, having been able to adjust all difficulties amicably even though on occasions these have been complicated and difficult. Our members are all associated with the wages board and after this long and successful experience they are satisfied that it fully meets the needs of this association in regard to the relations between employers and employed, and they consider it unnecessary and undesirable to form part of a national council."

It will be seen from the latter clause that the ironmasters are strongly averse to becoming part of any general council, preferring to be masters in their own industry. In regard to this they have the strongest backing of the workers themselves.

Interchange of Ideas Encouraged

An important duty which the government is encouraging to the utmost of its power is the maintenance of progress by the fullest utilization of the brains and experience of those engaged in industry. On this matter the ironmasters express themselves with the same note of decision. They say: "At the annual meetings of the board, and at some of the standing committee meetings, general questions are often discussed, and both sides welcome an interchange of ideas with regard to the better utilization of the practical knowledge and experience of the workpeople, and no difficulty will be found in this direction. Recently, as invited by posters in the various works, information was given in connection with puddling research." In conclusion, the letter states: "All such work can be dealt with by the existing machinery which provides for modification and the meeting of new conditions and circumstances. No board could have done more to secure permanent improvement in the relations between employers and employed. It recognizes the difficulty of problems ahead but confidently looks to its organization to deal with them as they arise."

New Methods Are Needed

The chairman made a significant reference to the necessity for new methods. He remarked: "America with its vast resources and its accelerated ability to employ them, and Germany with its determination not to be put out of the world's trade, and others whose iron and steel industries have expanded owing to war demands will be serious competitors. Already supplies have been sent to markets from which our own products have had to be withdrawn. It is for us to see to it that any improvements which can be devised by the closest co-operation and interchange of ideas shall be made. Already the puddling research committee has gone a long way in this work, and when the experimental side has proved successful, both sides must give whole-hearted support to a method which it is believed will lighten the labors and improve the conditions of the men, decrease costs and increase the power to meet greater and keener competition.

Workers Get Free Rides

Upon a request filed by the King county council of national defense, city officials and individual citizens of Seattle, Director General McAdoo has ruled that workers may use the steam trains to solve the transportation problem to shipyards, and for a time at least, the cost will be borne by the plants in proportion to the number of men transported. Workers will not be required to carry identification cards for the present, since it is not likely that anyone but a shipworker will make use of the special trains at the hours they are operated.

Makes Shipyard Ruling

A recent ruling of the labor adjusting board of the Emergency Fleet corporation provides for an 8-hour day, with the privilege of working not more than 12 hours with wages from 40 cents an hour for common laborers to 82½ cents for mechanics at shipbuilding plants in Connecticut and the North Atlantic section, including the Lake Submarine Co., Bridgeport, Conn., the Groton Iron Works, Groton, Conn., and the Housatonic Shipbuilding Co., Stratford, Conn.

The 24-hour strike of all union machinists in the Newport, R. I. district, set for May 1, as a protest against the death sentence of Thomas J. Mooney, in California, was called off since it would have interfered with government work at the United States torpedo station in Newport.

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

FREDERICK W. SINRAM, vice president of the Van Dorn & Dutton Co., Cleveland, recently was re-elected president of the American Gear Manufacturers' association, at the second annual meeting held in White Sulphur Springs, W. Va.. Mr. Sinram is a graduate of the Cleveland Law School of the Baldwin-Wallace university, Berea, O., but has been actively interested in the iron and steel industry for the past 20 years. Besides being vice president of the Van Dorn & Dutton Co., Mr. Sinram is secretary-treasurer of the Van Dorn Electric Tool Co., Cleveland. He is an apostle of the doctrine of standardization and was actively interested in the presentation of the question of standardized gears at the recent meeting of the association.

Donald A. Baker was recently made chief engineer for the Anderson Drop Forge & Machine Co., Detroit.

Fred Clausen has been appointed factory superintendent of the Independent Pneumatic Tool Co., Aurora, Ill.

Lewis Searing has sold his half interest in the Denver Engineering Works Co., Denver, Colo., to the Hardinge Conical Mill Co., New York.

Charles Philip Coleman has been elected president of the Worthington Pump & Machinery Corp., 115 Broadway, New York.

G. W. Akerlow and J. M. Lundquist have opened offices as consulting and mechanical engineers in Denver, Colo. They will specialize in mill design and special machinery.

F. S. Shields, president of the Cleveland Milling Machine Co., Cleveland, has purchased the American Range & Foundry Co., and will continue the business as the American Foundry Co., Cleveland. Mr. Shields' connection with the former company will in no way be affected.

Alfred L. Aicher, formerly chief draftsman of the F. J. Stokes Machine Co., Philadelphia, is now affiliated with the Southwark Foundry & Machine Co., Philadelphia.

E. C. Peck, for 18 years superintendent of the Cleveland Twist Drill Co., Cleveland, has been granted a leave of absence to accept a commission as major in the ordnance division of the war department. Major Peck will be associated with Maj. Gen. Wheeler and Brig. Gen. Rice and will supervise standardization and production of armament and munitions.

Norman O. Aeby, recently resigned as purchasing agent for the Jeffrey Mfg. Co., Columbus, O., coal drills and machinery, and has been made manager of

FREDERICK W. SINRAM

the foreign department of the Liberty Steel Products Co., New York. J. F. Davidson, formerly Mr. Aeby's assistant has been promoted to succeed him as purchasing agent.

Walter Brown, vice president and general manager of the Webster Electric Co., Racine, Wis., has been appointed to the war service committee to represent the magneto industries.

William H. Patton has resigned as depot manager for the Electric Storage Battery Co., Philadelphia, to become salesman for the Ironton Engine Co., Ironton, O.

E. L. Sparks, formerly industrial editor of *Engineering News-Record* has been appointed New England representative of the Ball Engine Co., Erie, Pa., manufacturer of steam shovels.

H. L. Cole, for several years the Milwaukee manager for Manning, Maxwell and Moore, New York, has been put in charge of the Milwaukee office of the Federal Machinery Sales Co., Chicago.

Carl T. Hewitt has been appointed metallurgist and testing engineer for the Fafnir Bearing Co., New Britain, Conn. He formerly was with the Remington Arms Union Metallic Cartridge Co. Inc., Bridgeport, Conn.

A. R. Smith, formerly general foreman in charge of the Anderson Forge & Machine Co.'s factory is now supervising construction of the $500,000 drop forge plant of the Pan Motor Co., St. Cloud, Minn., as general superintendent.

Harry D. Barrows for seven years the secretary of the Baron deHirsch Trade School, New York, has been appointed business manager of the American Machinery Exchange, Inc., 217 Centre St., New York.

H. T. Bently, for several years superintendent of motive power and machinery for the Chicago & Northwestern railroad has been granted a leave of absence to join the staff of the director general of railroads at Washington.

J. M. Marty Jr. has accepted a position as service engineer with the Kelly Reamer Co., Cleveland. Mr. Marty was formerly production manager of the Standard Pump & Engine Co., Akron, O.

Fred M. Shaw, formerly with the General Electric Co., has been made president of the Alfred L. Brown associates, Worcester, Mass., electric motors. Alfred L. Brown is treasurer and general manager.

H. N. Oram, foreman and chief patternmaker of the R. K. LeBlond Machine Tool Co., Cincinnati, has been made supervisor of castings and patterns at the new plant of the company at Norwood, O.

Fred B. Crosby, formerly in the power and engineering department of the General Electric Co., where he specialized in electrical equipment for steel mills, has accepted the position of electrical engineer for the Morgan Construction Co., Worcester, Mass.

Harry Stephenson has retired from the firm of Speed & Stephenson, Boston, textile machinery and mill supplies, and the business will be continued by the surviving partner, James Speed, under the name of James Speed & Co., 170 Summer street.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

HERBERT A. JACKSON, who was recently elected president of the Chicago Pneumatic Tool Co., Chicago, to succeed W. O. Duntley, resigned, was born in Bethlehem, Conn., July 7, 1881. After being graduated with the class of 1903, from the Lawrence scientific school of Harvard university, he took a year's course in metallurgical work in the graduate school there. In July, 1904, he entered the employ of the Bethlehem Steel Co., working through various departments to the sales department and spent some months as sales agent in Chicago. When the Bethlehem Steel Co., opened its Boston office, Mr. Jackson was sent to organize the sales and executive forces in that territory, where he remained in charge until elected to his new position at a special meeting of the Chicago Pneumatic Tool Co.'s board of directors in New York, April 19, 1918.

F. H. Otis has been appointed purchasing agent of the Iroquois Iron Co., Chicago, to succeed Ed. Rosen.

George E. Bent was recently made manager of the Chateaugay Ore & Iron Co., Lyon Mountain, N. Y.

J. Stanford Brown resigned recently as director of the Carpenter Steel Co., Reading, Pa., and is succeeded by Charles T. Meily, Philadelphia.

G. W. Ketter has joined the staff of the Electric Furnace Construction Co., Philadelphia, having resigned his position with the British Forging Co. Ltd., Toronto, Ont.

Daniel Bloomfield was recently made head of the industrial service department, division of general service of the Emergency Fleet corporation, Philadelphia.

Thomas H. Beaulac has been appointed superintendent of the foundry operated by the Union Iron Works, Bangor, Me.

T. J. Wetzell, president of the Wetzell-Hall Co., New York city, manufacturers' agent, was recently elected vice president of the Buffalo Pressed Steel Co., Buffalo.

C. A. Miller, who has been assistant purchasing agent for several years at the Carnegie Steel Co., Pittsburgh, was recently promoted to the position of general purchasing agent, to succeed J. M. Taylor who resigned after 25 years of continuous service.

F. E. Whitcomb, who resigned recently as signal engineer of the Boston & Albany railway, has been made special New York city representative of the Federal Signal Co., Albany, N. Y.

A. L. Martin has been made district manager in the recently established of-

HERBERT A. JACKSON

fices at 260 California street, San Francisco, of the Liberty Steel Products Co. Inc., Youngstown, O.

N. M. Garland, who has been district manager of the Ohio Brass Co., at Mansfield, O., for a long time, was recently elected a member of the board of directors.

John S. Agey, employed for 13 years by the Carnegie Steel Co., Youngstown, O., has been made assistant superintendent of one of the mills of the Donner Steel Co., Buffalo.

George W. Hubley became general manager of the Bound Brook Engine & Mfg. Co., Philadelphia, upon his resignation as general manager and chief engineer of the Merchants' Heat & Light Co., Indianapolis.

Louis Snyder, secretary to J. G. West Jr., superintendent, Eliza furnace department of the Jones & Laughlin Steel Co., resigned recently to become advertising manager of the Safety First Supply Co., Pittsburgh.

M. A. Stone resigned recently as general superintendent of the Wolverine Brass Works, Grand Rapids, Mich., to organize the M. A. Stone Mfg. Co., that city, of which he is president, to manufacture small cast parts and stampings.

James M. Smith now has charge of the shipbuilding plant of the Canadian Car & Foundry Co., Fort William, Ont., which expects to turn out 12 trawlers for the French government before the end of the 1918 season.

John Salt is now assistant to E. Talkes, master mechanic of the Federal furnace of the Iroquois Iron Co., Chicago. He formerly was assistant to J. E. Burkett who had charge of the coke ovens.

James C. Redman, affiliated for a long term of years with the A. M. Byers Co., Pittsburgh, has opened offices in the Rialto building, San Francisco, to represent manufacturers of iron and steel products.

R. B. Wallace was recently appointed sales agent of the Bethlehem Steel Co., in charge of the Boston district, to succeed H. A. Jackson, who resigned to become president of the Chicago Pneumatic Tool Co., Chicago.

Lieutenant Victor Garmen has been given a position as safety engineer of the Lebanon, Pa., plants of the Bethlehem Steel Co. Until lately, he was with the machine gun battalion of the Rainbow Division of the American forces in France.

George A. Arms was elected president of the Moore Shipbuilding Co., San Francisco and Oakland, upon his resignation as engineer in charge of construction work in the San Francisco district for the United States shipping board.

M. V. Dreyspool, who has been affiliated with the Vulcan Steel Products Co., New York City, since its formation has become associated with the sales department of the American Steel Co., Pittsburgh. Prior to his joining the Vulcan Steel organization, he was assistant purchasing agent of the Central of Georgia railroad at Savannah and later was metropolitan sales agent of the Phoenix Iron Co., New York.

Iron and Steel Men in War Machine

George N. Peek, Industrial Representative, War Industries Board

GEORGE N. PEEK is known in official Washington circles as industrial representative of the war industries board. This title covers a big job. He was called to Washington the latter part of 1917 to solve one of the leading industrial problems that confronted the government at war, namely that of securing necessary military supplies without too seriously interfering with the production of necessities for the public welfare, and at the same time of insuring industrial strength after the war. His was and is the task of converting peace time factories to war time centers of production. The importance and magnitude of the work as well as the responsibility connected with it, is reflected in a statement made by a prominent man in Washington, who said: "So heavy are the present demands on labor, materials, fuel, capital and transportation that it would be easy for a single order from a government agency to utterly wreck an industry representing invested millions and supporting thousands of families." In addition to his duties as a vice president of Deere & Co., Moline, Ill., manufacturers of farm implements, Mr. Peek is a member of the firm's board of directors, a member of its executive committee and a voting trustee. For some time, he has represented the implement industry on the executive board of the National Implement and Vehicle association..

About 10 years ago, Mr. Peek was a sales agent for Deere & Co., in charge of the Omaha, Neb., territory and when the consolidation of all the Deere interests took place a few years ago, he was elected vice president in charge of sales, with headquarters at Moline.

His many duties in behalf of the government were recently increased when he was placed in charge of the finished products section of the board, practically handling the work previously covered by Robert S. Brookings. Official recognition, however, awaits the final reorganization of the board, along the lines recently announced.

That Mr. Peek has a full grasp upon all that is entailed in connection with his responsibilities as a part of the war machine, is evidenced by a published statement, in which he said: "It would seem to be the immediate duty of the war industries board: "To list, by classes or otherwise, those industries whose operation as a war measure are of exceptional importance, classifying them in the order of their relative urgency, measured by their contribution to the winning of the war.

"To determine what are the less important industries, on the same basis.

"To prepare, present and, if practicable, enforce such concrete plans as will result in stimulating the operation of the industries first named; curtailing the operation of the nonessential industries or changing their operations to produce war needs; conserving the supply of essential raw materials as reserves to be drawn upon to meet the war requirements". He said recently that with co-operation industry should emerge after the war improved for those conditions.

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GEORGE N. PEEK

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Business Still Opposed to Lump Tax

SECRETARY OF TREASURY McADOO has reiterated his opposition to the proposed plan of providing for deferred installment payments of income and excess profits taxes. To defer the payments until fall, when another Liberty loan will have to be issued, Mr. McAdoo said, would complicate the situation. He explained that nearly $2,000,000,000 of treasury certificates already have been sold to mature in June, and these virtually amount to advance payments of the taxes due them. He asserted the continued agitation for deferred tax payments "is doing much harm."

"We should make up our minds," he added, "to pay these taxes when they are due and get the business behind us. I earnestly hope that further agitation may cease and that everyone will co-operate in the patriotic determination to do his duty in the payment of taxes at the time that duty ought to be performed."

War Corporation May Give Relief

Chairman Kitchin, of the house ways and means committee also issued a statement on this subject, in which he said that to postpone collection of taxes past June would make it necessary for the government to issue more bonds to meet the certificates due them. Referring to reports that some manufacturers with important government contracts would be seriously hampered financially by having to pay big taxes in June, he said:

"If a business concern really has a government contract and is really performing a service that is useful to the conduct of the war, and if such concern cannot get relief through its bank, I think in such case the War Finance Corp., when organized, will consider an application from the concern and give relief if found necessary."

Business interests generally have hoped that steps would be taken to prevent the payment of an estimated total of $4,500,000,000 of taxes in one day. It has been believed that this withdrawal would subject the country to a serious financial strain. A number of bankers and business men conferred with Washington authorities just prior to the statements by McAdoo and Kitchin. Members of Liberty loan committees have declared that the forthcoming tax payments have held back subscriptions to the loan in some quarters.

Metal Trades Support Installments

In line with the general movement for the collection of taxes on an installment plan, the National Metal Trades association at its annual convention in New York last week went on record with a resolution, which it is bringing to the attention of the President, Secretary McAdoo, congress and the senate and house finance committees. This resolution in effect said that whereas it was necessary the finances of industries engaged in war work be safeguarded; and whereas financial needs have been increased by higher costs and increased outstanding credits, due to difficulties of moving output; and whereas the payment of the taxes at time now provided still further increases the demands upon financial resources; and whereas it is the earnest desire of the members to contribute to the current and future Liberty loans to the full extent of their ability and the carrying out of this desire is hampered by the financial demands above indicated; be it resolved that the National Metal Trades association respectfully petition that measures looking to the payment of income and excess profits taxes in installments instead of one payment be acted upon as promptly as possible.

Makes Sales Record With No Munition Orders

The General Electric Co. in 1917 sold 47 per cent more goods than its best preceding year, which was 1916, yet it did not have a dollar's worth of war munition business on its books, according to the annual statement. Gross sales were $196,926,317, compared with $134,242,290 in 1916 and $85,522,070 in 1915, when shell orders aggregated $33,980,000 of the aggregate orders booked. The final balance of $26,903,828 available for dividends was equal to 26.5 per cent on the outstanding stock, compared with 18.3 per cent the year before. The outstanding features of the report follow:

	1917	Increase over 1916
Sales	$196,926,317	$62,684,027
Operating profit	29,004,539	13,710,448
Total net income	33,516,829	14,355,846
Excess profits tax	5,500,000	5,500,000
Dividends	11,165,882	3,043,236
Surplus	15,737,946	5,370,064

Chairman C. A. Coffin stated that while a substantial portion of the year's increase in business consisted of government orders for ship propulsion, the increase extended to nearly every line of the company's product.

Canadian Car Earning at New High Rate

The annual report of the Canadian Car & Foundry Co., covering the 12 months ending Sept. 30, 1917, shows net surplus for the year of $1,413,008, which represents practically the net earnings from Russian shell contracts. Net profits from operations in Canada have been only approximately sufficient to pay the fixed charges. The most significant feature of the report, however, is the tentative net profits for the first six months of the current fiscal year of 1918, after payment of fixed charges are approximately $1,500,000. At this rate the company will establish a new record of $3,000,000 for the current year, which after paying 7 per cent on the preferred would leave a balance well up to 50 per cent for the common. War munition and export equipment orders were again the chief factors in 1917 operations, accounting for more than one-half the gross output of $25,000,000. More than 75 per cent of the $36,500,000 unfilled orders on the company's books at the present time, however, represents orders for the regular normal products of the car equipment business. Including the profits on the Russian contracts,

manufacturing profits in 1917 were $2,572,883. Approximately double the total of the preceding year, while the net profits of $1,413,008 were approximately four times the 1916 figures. The profit and loss statements for three years are summarized in the following table:

	1917	1916	1915
Profits	$2,572,883	$1,292,104	$321,839
Deprec.	467,609	350,000	325,000
Balance	$2,105,273	$942,104	*$3,160
Interest	692,265	588,848	555,311
Net profit	$1,413,008	$353,255	*$558,471
Prev. surp.	1,427,054	1,073,798	1,632,269
Surplus	$2,840,063	$1,427,054	$1,073,798

*Deficit.

In his message to stockholders, President Currie says in part: "If unforeseen conditions and contingencies beyond your management's control do not arise your present order book assures continuous and profitable operations during the year of 1918. In fact, the tentative figures prepared by our comptroller indicate that the net profits for the first six months of the fiscal year of 1918, after payment of fixed charges, will approximate $1,500,000."

Tool Companies Merge

The Independent Pneumatic Tool Co., Chicago, a New Jersey corporation, and the Aurora Automatic Machinery Co., incorporated in Delaware, have been consolidated under the name of the former and has been capitalized at $3,000,000. The directors of the company follow: John P. Hopkins, chairman; John D. Hurley, James J. McCarthy, William A. Libkeman, Leonard S. Florsheim, Edward G. Gustafson, Robert T. Scott, Ralph S. Cooper, August Gatzert and Fletcher W. Buchanan. The following officers have been elected: John D. Hurley, president; Ralph S. Cooper, vice president; Fletcher W. Buchanan, secretary, and Edward G. Gustafson, treasurer. The general offices of the company are in the Thor building, 1307 South Michigan boulevard, Chicago. The pneumatic and electric tool plant is located at Aurora, Ill., and motor cycles and gasoline engines are manufactured at 361 West Superior street, Chicago.

Increases Capital Stock

At a special meeting of stockholders of the Liberty Steel Co., Warren, O., held at Youngstown, O., April 29, the capital stock was increased from $900,000 to $1,500,000. The new stock will be $250,000 preferred and $350,000 common. All of the preferred and an indefinite amount of common will be issued at once and the funds will be used for working capital. Decision as to the installation of four additional hot mills was postponed until a later date.

Has Large First Quarter

Gross earnings of the Colorado Fuel & Iron Co. in the first quarter of 1918 were $11,931,230, an increase of $1,099,919 over the same period last year. The net income was $1,724,050, against $1,762,116, which was reduced by depreciation and depletion fund reservations to $1,232,315, an increase of $32,344. After paying dividends a surplus of $935,509 remained.

Issues Stock Dividend

Directors of the Gulf States Steel Co., Birmingham, Ala., have voted a 25 per cent stock dividend, subject to the approval of the capital issues committee, payable June 3 to holders of record May 15. The company has outstanding $7,314,400 common stock, most of which is deposited in a voting trust. It is paying 10 per cent dividends. On receipt by the voting trustees of the new trust certificates representing the dividend stock, they will be distributed to the present owners of trust certificates. Holders of trust certificates for the second preferred stock will be able to participate in the distribution if they convert their holdings into common stock trust certificates, which may be done, par for par, prior to May 15. The conversion privilege has been in effect since the company was formed in 1913, to contain properties of the old Southern Iron & Steel Co.

Lakewood Firm Expands

To finance the purchase of several additional plants, the Lakewood Engineering Co., Cleveland, has increased its capital stock from $300,000 to $1,100,000. Among the purchases to be made are the following: The Dynamic Motor Truck Co., Galion, O., a foundry at Elyria and a large interest in the Milwaukee Concrete Mixer Co., Milwaukee.

Sales Are Heavy

Net sales of the Hale & Kilburn Co., Philadelphia, in 1917 were $4,235,582, an increase of $1,104,772 over the preceding year. The balance for dividends was $262,158, compared with $23,045 in 1916. Joseph A. Bower, president, in his annual report urged stockholders to exchange their stocks in the old Hale & Kilburn Co., if they had not already done so, for stock in the new corporation.

Requisition Sulphate

For Nitrate Manufacture by Government—Phenol Buying is Expected

New York, April 27.—Large quantities of sulphate of ammonia again were requisitioned by the government this week for manufacture into nitrate of ammonia. It now seems quite certain that contracts for the coming year will not be made as in the past. In fact, a number of large consumers have been told that the first duty of the producers will be to supply the government, after which consumers will share on a pro rata basis. Current business, outside of sales to nitrators under government direction, consists of spot carloads at $5.55 to $5.60 per 100 pounds.

Direct intimations are heard that the government is considering the purchase of phenol on a fairly large scale for the manufacture of picric acid. The use of phenol and benzol, however, in making picric acid has gone no farther than the prospective stage. In the meantime, toluol continues to be relied upon principally. In almost all cases the high explosives which now are being derived from benzol and phenol are for either France or England. Considerable additional toluol for commercial consumption was released this week by the committee of the war industries board. Such toluol is going at $1.75 to $2 per gallon. Occasional sales by second hands continue to be made at $5 and $6.

Benzol is weak, and sales have been made in some instances at as low as 28 cents per gallon. Although there is some contracting, most of the current buying is for spot. Solvent naphtha continues at 18 to 22 cents per gallon, while spot ranges from 18 to 25 cents.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant	
Pure benzol	$0.28 to .35
Toluol (on sales sanctioned by government)	1.75 to 2.00
Solvent naphtha	.18 to .25
Per Pound at Producers Plant	
Phenol	$0.52 to .55
Naphthalin (nominal)	.10 to .12
Per 100 Pounds at Seaboard	
Sulphate of ammonia	$5.55 to 5.60

Contract

Pure benzol	$0.28 to .35
Toluol	no market
Solvent naphtha	.18 to .22
Per Pound at Producers Plant	
Phenol nominal.	
Per 100 Pounds at Seaboard	
Sulphate of ammonia	nominal

How Lake Fleet Will Meet Ore Needs

Vessels on Great Lakes Are Now Going Into Commission—Operators Plan to Handle Required Tonnages of Ore, Coal and Grain With Minimum Strain on Railroads

BY R. V. SAWHILL

AMERICAN ships capable of carrying 3,000,000 to 4,000,000 tons of cargo in one trip have just been released from a blockade more effective than any the allies have succeeded in drawing around their enemies. One by one these ships have been quietly recommissioned during the past few days and within a short time the entire fleet will be vigorously plying its native waters, the Great Lakes. As a war asset this great fleet of bulk freighters far outranks any additions to the American merchant marine made by the wholesale absorption of German or Dutch tonnage or by the new ships built up until this time.

Resumption of navigation on the Great Lakes is always an event surcharged with the highest importance to the iron and steel industry of the United States. Burdened this year with the responsibility of giving force to America's war program and to the plans of our allies, steel manufacturers to a greater extent than ever before are interested in the renewal of activity by one of the most important branches of their industry. The cause of this interest is realized from an appreciation of the fact that the fleet of bulk freighters on the lakes annually brings from the mines of the north to the blast furnaces of the central west and east about 85 per cent of the basic raw material upon which the iron and steel industry rests.

Meeting an Increased Demand

Recognition by the vessel operators of their responsibility in enabling pig iron manufacturers to operate at capacity has always been shown by the satisfactory record made each year. With little increase in vessel tonnage, the operators during the past two years have faced and satisfied a demand which jumped from an average of 45,000,000 to 50,000,000 tons in 1912-1915 up to 60,000,000 to 65,000,000 tons in 1916-17.

This year the estimated minimum consumption of iron ore by blast furnaces tributary to the lakes during the next 12 months will be about 60,000,000 tons and the capacity of the lake fleet to satisfy this need is freely granted provided the complementary agencies of transportation can do their share. This feeling of confidence is all the more notable when it is recalled that dozens of lake boats have been removed from fresh water to participate more directly in the transatlantic war trade and also in view of the repeated delays which consumers dependent upon other forms of transportation have learned to expect during the past year.

Large Ore Chart Sent on Request

Consumers and producers of Lake Superior iron ore, operators of lake vessels, officials of railroads carrying commodities transported on the lakes, and operators of coal mines whose products are shipped on the lakes, are vitally concerned this year in the plan for centralized control of the lake trade which has been worked out and approved. In view of this interest, THE IRON TRADE REVIEW *has prepared in larger form suitable for framing or for desk or wall use—a chart similar to that shown on page 1140. This shows graphically the duties and personnel of each committee together with the major statistics of the lake trade for the last 10 to 15 years such as shipments of iron ore, capacity of the lake fleet, movement of iron ore by railroads both in upper and lower lake districts, and the shipments of coal. The large chart will be supplied free upon request to* THE IRON TRADE REVIEW, *Penton building, Cleveland.*

Efficient operation as developed on the Great Lakes has become a familiar by-word in recent years. An insight into the reasons for this efficiency is given by the elaborate preparations made during recent months by the vessel operators to minimize the effect of railroad congestion at unloading ports and the loss of boats from lake trade, by the adoption of even more efficient methods of operation.

The plan which has been developed is designed to utilize at all times the maximum freight-carrying capacity of all lake vessels. The means by which this is to be obtained is through a centralized supervision over all of the ships. Central agencies are to be charged with the tasks of directing the water and land carriers most effectively while other central committees will supervise the special interests of the iron and coal industries. All of these committees will work through a central clearing station in which the relative importance of the principal component elements of lake trade—iron ore, coal and grain—can be so reconciled that at the end of the season blast furnaces along the lower lakes will have a sufficient but not excessive supply of iron ore; the industries of the northwest which are supplied with fuel from the head of the lakes will have enough coal; and the imperative needs of the United States and its European allies for wheat will have been met by the movement of the greatest possible tonnage during the closing fall months of the season.

Ore to Move Freely

In effect, vessel owners on the Great Lakes have practically turned over their fleets to the central committee to operate. With the railroads of the country under one control, every effort will be made to distribute the ore cars in such a way as to keep the ore moving freely out of all lower lake ports. Each consumer of Lake Superior iron ore had been asked to have someone in Cleveland qualified to represent his interest. The committees have held preliminary meetings and now that the boats are going into commission, the men who will carry on the job feel that every precautionary step has been adopted to insure consumers getting those supplies which lake boats must carry this year.

The accompanying chart shows graphically just how the 1918 organization of lake trade is built up.

The spectacle of an immense fleet of ships, almost in a week's time springing from inactivity to full activity has become so commonplace on the lakes that little attention is given to the means by which such a transformation is made possible.

A few weeks before the season

opens active fitting-out begins and various officers and men board the boats and put them in shape for operation as soon as word is flashed that the channels are free from ice. During the winter months actual repair work has been carried on so that always at the opening of the season the boats are in excellent condition. The recruiting of the crews, even in the face of a scarcity of labor such as obtains at the present time, is a much simpler matter than generally realized. The sailors, who scatter when the boats are laid up in the winter, generally find their way back to the ships when the first sign of spring awakens the men's liking for a sailor's life. Young boys recruited from the farms or from the schools can be relied upon to fill out most of the vacancies resulting from defections on the part of the old crews.

This year the lake boats will carry in addition to their regular crews members of the naval auxiliary reserve. These are boys who will be given instruction in practical navigation and after several months' experience on the lakes will be transferred to an Atlantic port for final drilling before taking their place in the merchant or naval service.

This year for the first time exact information will be held from the opening of the season as to the minimum requirements of iron ore needed by every blast furnace up until June 1, 1919. Every consumer has been asked to specify the minimum tonnage required to keep his plant in operation until new ore begins to arrive at lower lake ports next spring. As a result, the men back of the job know how the exact tonnage of ore that must be carried and the exact amount that must be placed in each individual furnace yard. A better correlation of the efforts of the vessel and railroad interests can thus be obtained. Every effort will be made to give each furnace the exact tonnage required. No surplus tonnage of iron ore will be carried as the vessels not only must be employed during much of the time in the coal and grain trades, but the lower lake railroads must be freed from any additional burden or delay.

The crux of the ore situation today is in the ability of the railroads to move ore from lower lake ports to blast furnace yards and the plan under which the lake trade will operate this year is a measure designed more to aid the railroads than the vessels.

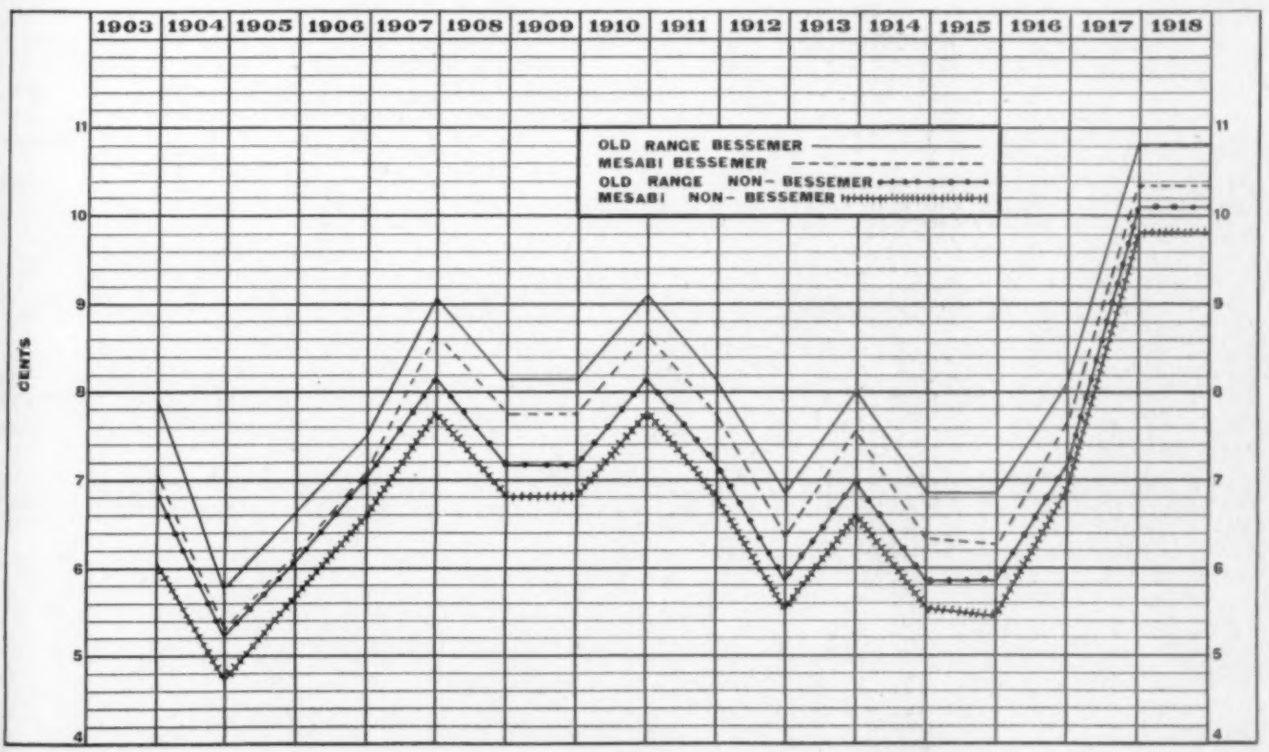
Ore prices are a subsidiary feature as the season opens. Since last fall ore prices have been subject to government regulation. With the normal market closed, the bulk of the ore operators have been giving their attention almost exclusively to the problems of mining and transporting their product. The present scale of ore prices maintains the 1917 quotations with no likelihood of any change until after the end of the second quarter of the year, if at all. The ore trade has been forced to readjust itself from the 12-month basis in which business has always been conducted in order to meet the quarterly adjustment of iron and steel prices, President Wilson put into effect on Jan. 1.

Ore contracts, however, have been adjusted to meet the changed conditions. A clause inserted in all ore contracts written this year provides for the adjustment of the contract price to meet any change in the fixed quotations as set by an authorized government agency. Efforts have been made by a number of iron ore producers to secure favorable action by the government on their request for a higher level of quotations on iron ore. These

Values of Unit of Iron for 16 Years

	Old range		Mesabi	
	Bessemer, cents	Non-bessemer, cents	Bessemer, cents	Non-bessemer, cents
1918.....	10.81	10.10	10.36	9.81
1917.....	10.81	10.10	10.36	9.81
1916.....	8.09	7.18	7.64	6.89
1915.....	6.82	5.83	6.27	5.44
1914.....	6.82	5.83	6.36	5.53
1913.....	8.00	6.99	7.55	6.60
1912.....	6.82	5.83	6.36	5.53
1911.....	8.18	7.18	7.73	6.80
1910.....	9.09	8.16	8.64	7.77
1909.....	8.18	7.18	7.73	6.80
1908.....	8.18	7.18	7.73	6.80
1907.....	9.09	8.16	8.64	7.77
1906.....	7.50	7.01	7.05	6.60
1905.....	6.61	6.06	6.17	5.66
1904.....	5.73	5.21	5.29	4.73
1903.....	7.94	6.82	7.05	6.06

Fluctuations of iron ore prices expressed in values of units of iron in natural state.



RANGE OF LAKE SUPERIOR ORE PRICES BY UNITS OF IRON, NATURAL

PERSONNEL AND FUNCTIONS OF ORGANIZATION DIRECTING 1918 LAKE TRADE

AMERICAN IRON AND STEEL INSTITUTE

IRON ORE COMMITTEE

Chairman
H. G. DALTON
Pickands, Mather & Co.

A. H. WOODWARD, Woodward Iron Co.
W. T. SHEPARD, Rogers, Brown & Co.
FRANK BILLINGS, Tod-Stambaugh Co.
C. D. DYER, Shenango Furnace Co.
H. COULBY, Pittsburgh Steamship Co.
F. B. RICHARDS, M. A. Hanna & Co.
LEONARD PECKITT, Empire Steel & Iron Co.
A. S. MATHER, Pickands, Mather & Co. Secretary

U. S. SHIPPING BOARD

VESSEL COMMITTEE

Chairman
H. COULBY,
Pittsburgh Steamship Co.

C. L. HUTCHINSON, Hutchinson & Co.
C. D. DYER, Shenango Steamship Co.
G. A. TOMLINSON,
J. S. ASHLEY, M. A. Hanna & Co.
Capt. W. C. RICHARDSON, W. C. Richardson & Co.
H. S. WILKINSON, Great Lakes Steamship Co.

U. S. FUEL ADMINISTRATION

COAL COMMITTEE

Chairman
A. A. AUGUSTUS,
Cambridge Collieries Co.

HORACE ROBBINS, Youghiogheny & Ohio Coal Co.
GEORGE CAMERON, Pickands, Mather & Co.
C. E. MAURER, Glen's Run Coal Co.
R. S. McVEIGH, Island Creek Coal Co.
J. P. WALSH, Pittsburgh Coal Co.
WILLIAM COLLINS, M. A. Hanna & Co.
E. A. URHIG, Milwaukee-Western Fuel Co.

REGIONAL DIRECTOR OF RAILROADS

RAILROAD COMMITTEE

GEORGE L. PECK,
Pennsylvania Railroad

ADMINISTRATION COMMITTEE

ONE REPRESENTATIVE FROM EACH OF FOUR INTERESTS

ORE	VESSELS	COAL	RAILROADS
MATTHEW ANDREWS, M. A. Hanna & Co.	H. COULBY, Pittsburgh Steamship Co.	A. A. AUGUSTUS, Cambridge Collieries Co.	GEORGE L. PECK, Pennsylvania Railroad

ORE AND COAL EXCHANGE

Manager
H. M. GRIGGS

OPERATING COMMITTEE ORE

CARGO LOADING, UNLOADING AND DISTRIBUTION

Chairman
E. C. COLLINS
Pittsburgh Steamship Co.

A. E. R. SCHNEIDER, Cleveland-Cliffs Iron Co.
GEORGE H. WARNER, M. A. Hanna & Co.

OPERATING COMMITTEE VESSELS

VESSEL DISTRIBUTION AND SUPPLY

Chairman
W. H. McGEAN, Hutchinson & Co.

KENNETH A. SCOTT, G. A. Tomlinson
R. H. PIGOTT
JOHN T. KELLY, W. C. Richardson & Co.
A. W. THOMSON, Wilson Transit Co.
W. M. WILLIAMS

OPERATING COMMITTEE COAL

CARGO ALLOTMENT, LOADING AND UNLOADING

Chairman
FRED J. KENNEDY,
Reiss Coal Co.

J. H. WOODS, Pittsburgh Coal Co.
J. L. FOREPAUGH, Northwestern Fuel Co.

OPERATING COMMITTEE RAILROADS

CAR SUPPLY AND MOVEMENT

STAFF MEN

Annual Lake Movement of Iron Ore and Coal; Ore Shipments by Railroads; Vessel Capacity

ORE SHIPMENTS BY LAKE

Year	Gross Tons	Year	Gross Tons
1917	62,498,901	1911	32,130,411
1916	64,734,198	1910	42,628,758
1915	46,318,804	1909	41,683,599
1914	32,021,897	1908	25,427,094
1913	49,070,478	1907	41,290,709
1912	47,435,777	1906	37,513,589

CAPACITY OF LAKE BOATS

CARRYING CAPACITY, ONE TRIP

Year	Gross Tons	Year	Gross Tons
1918	3,225,763	1911	3,108,330
1917	3,109,585	1910	2,973,447
1916	3,073,319	1909	2,853,344
1915	3,066,423	1908	2,766,781
1914	3,031,589	1907	2,442,754
1913	3,124,508	1906	2,065,111
1912	3,135,953	1905	1,919,285

COAL SHIPMENTS BY LAKE

Year	Net Tons	Year	Net Tons
1917	31,192,603	1911	25,700,104
1916	28,792,800	1910	26,478,068
1915	26,220,000	1909	18,617,396
1914	27,280,228	1908	19,288,098
1913	33,362,379	1907	21,486,927
1912	27,539,741	1906	17,273,718

ORE MOVED BY RAILROADS

FROM LAKE ERIE DOCKS TO INTERIOR FURNACES May 1-Dec. 1	Gross Tons	ALL RAIL FROM MINES Year	Gross Tons
1917	32,758,549	1917	1,338,102
1916	33,941,962	1916	1,934,288
1913	27,027,058	1915	983,547
1914	17,650,073	1914	707,829
1913	23,934,126	1913	876,638
1912	24,884,646	1912	785,769
1911	17,187,072	1911	662,719
1910	29,894,267	1910	813,639

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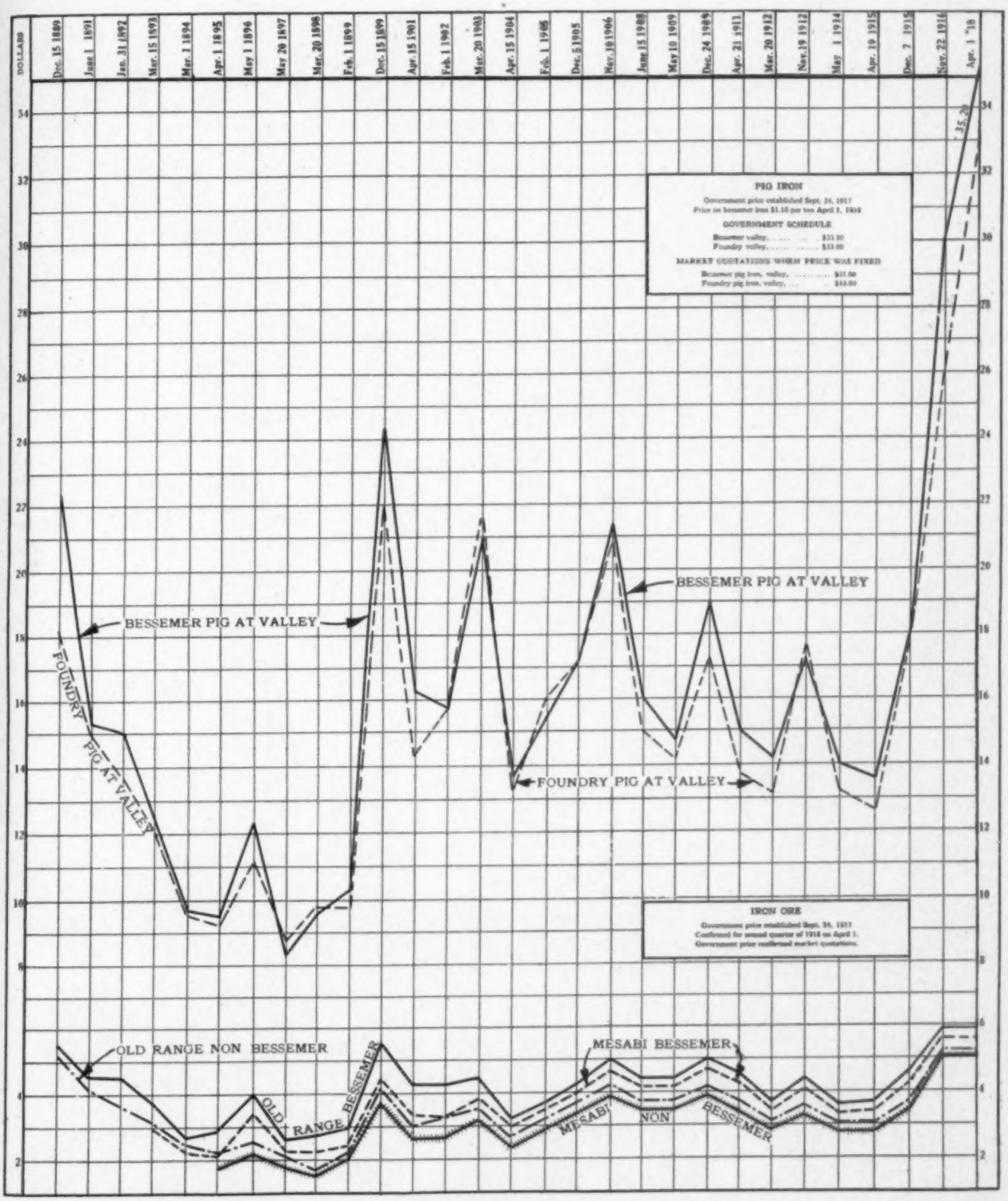
efforts probably will be renewed when third quarter prices are taken up for consideration at Washington in June, as some of the operators, particularly those with underground properties, have found their cost line closely approximating the government scale.

At the other end of the ore trade—the iron mining districts around Lake Superior—no doubt is entertained of the ability to place as much ore in the docks at upper lake ports as the vessels can carry. Labor shortage is somewhat more acute now than at any previous time, but even if underground mines experience difficulty in sending forward as much ore as planned, the huge open pits supply an immense reserve which can be drawn upon cheaply and at a moment's notice. The railroads leading from Lake Superior mines to the ports have always proved capable of handling all of the ore offered. While some of the equipment required during the summer for carrying iron ore has been shifted to other districts during the winter, the cars and locomotives are gradually being returned. In view of the clear recognition which govern-



FLUCTUATIONS OF PRICES OF IRON ORE AND PIG IRON, 1889-1918

ment officials have of the necessity of keeping the iron and steel business running at top speed, the injection of government ownership is not expected to curtail the ability of the ore-carrying railroads of the Lake Superior district to satisfy the demands which the vessels will place upon them.

The accompanying tables and charts give briefly the history of the movement of iron ore and pig iron prices in recent years. They permit easy comparison of the relations between iron ore and pig iron prices and show their relative declines and increases.

Prices of Iron Ore and Pig Iron at Date of Buying Movement, 1890-1918

Season	Date buying movement	—Season Iron Ore Prices— Old range Bessemer	Mesabi Bes'm'r	Old range non-Bes'm'r	Mesabi non-Bessemer	—Iron Prices— Valley Bes'm'r	Foundry Iron No. 2
1918	Apr. 1, 1918	$5.95	$5.70	$5.20	$5.05	$35.20	$33.00
1917	Nov. 22, 1916	5.95	5.70	5.20	5.05	30.00	26.00
1916	Dec. 7, 1915	4.45	4.20	3.70	3.55	18.50	18.00
1915	Apr. 19, 1915	3.75	3.45	3.00	2.80	13.60	12.75
1914	May 1, 1914	3.75	3.50	3.00	2.85	14.00	13.25
1913	Nov. 19, 1912	4.40	4.15	3.60	3.40	17.25	17.50
1912	Mar. 20, 1912	3.75	3.50	3.00	2.85	14.25	13.25
1911	Apr. 21, 1911	4.50	4.25	3.70	3.50	15.00	13.75
1910	Dec. 24, 1909	5.00	4.75	4.20	4.00	19.00	17.25
1909	May 10, 1909	4.50	4.25	3.70	3.50	14.75	14.25
1908	June 15, 1908	4.50	4.25	3.70	3.50	16.00	15.00
1907	Nov. 5, 1906	5.00	4.75	4.20	4.00	21.50	21.50
1906	Dec. 5, 1905	4.25	4.00	3.70	3.50	17.25	17.25
1905	Feb. 1, 1905	3.75	3.50	3.20	3.00	15.50	16.00
1904	Apr. 15, 1904	3.25	3.00	2.75	2.50	13.35	13.15
1903	Mar. 20, 1903	4.50	4.00	3.60	3.20	21.50	21.65
1902	Feb. 1, 1902	4.25	3.25	3.25	2.75	15.90	15.90
1901	Apr. 15, 1901	4.25	3.25	3.00	2.75	16.15	14.40
1900	Dec. 15, 1899	5.50	4.50	4.25	4.00	24.15	22.15
1899	Feb. 1, 1899	3.00	2.40	2.15	2.00	10.30	9.75
1898	Mar. 20, 1898	2.75	2.25	1.85	1.75	9.55	9.80
1897	May 20, 1897	2.60	2.25	2.15	1.90	8.35	8.40
1896	May 1, 1896	4.00	3.50	2.70	2.25	12.40	11.15
1895	April 1, 1895	2.90	2.19	2.25	1.95	9.40	9.40
1894	Mar. 1, 1894	2.75	2.35	2.50	no sale	9.65	9.65
1893	Mar. 15, 1893	3.85	3.00	3.20	no sale	12.65	12.15
1892	Jan. 31, 1892	4.50	no sale	3.65	no sale	15.00	13.65
1891	June 1, 1891	4.50	no sale	4.25	no sale	15.15	15.00
1890	Dec. 15, 1889	5.50	no sale	5.25	no sale	22.15	18.15

Coke Output Grows

Statistics of coal and coke production in Alabama in 1917 show an increase of 2,178,216 tons in coal and 483,105 tons in coke. The coal production in the 11 coal producing counties of the state amounted to 20,412,841 tons in 1917 against 18,234,625 tons in 1916. Four counties produced coke, the total being 4,868,598 tons, against 4,385,493 tons in 1916. Two of the 11 counties showed decreases in coal production and one county in coke output.

Completing Tin Smelter

An interesting feature of the annual report of the National Lead Co., just issued, is the statement by President J. Cornish with regard to the company's tin smelting preparations. He said: "The tin smelting works being constructed in Brooklyn by the Williams Harvey Corp. is nearing completion. There have been delays due to war conditions, but operations are expected to begin in July. The National Lead Co. and the former owners of the Williams Harvey Co., Ltd., of England, have sold one-third of the outstanding capital stock of both the English and American corporations to Simon I. Patino, the largest individual tin mine owner in Bolivia. Under the present stock ownership in both companies, the miner, smelter and distributor are equally interested in the success of the enterprise."

Acquire Shafting Plant

Transfer of 65 per cent of the outstanding stock of the Pennsylvania Shafting Co., Spring City, Pa., to the Latshaw Steel & Metal Products Corp., has been completed. H. L. Latshaw has been elected president and chairman of the board; William Parker, vice president; James Taylor, treasurer and director; R. Hueber, secretary and director; and R. Grass, assistant secretary. The first four named with Alfred C. Harmer form the board of directors. The shafting company is being reorganized and the plant will be fully operated. General sales offices have been transferred to 220 Broadway, New York. On May 1, larger offices will be provided at 261 Broadway which will become the general offices and the sales headquarters for both companies. The new Chicago office of the Latshaw Steel & Metal Products Corp., Railway Exchange building, will serve the same capacity for the Pennsylvania Shafting Co. Marvin W. Singer, vice president of the Latshaw corporation will represent the new organization in the Chicago territory.

Percentages of Advances and Declines in Ore and Pig Iron, 1903-1918

Year	Old range bessemer	Advance or decline in price	Advance or decline in per cent	Bessemer pig iron Valley	Advance or decline in price	Advance or decline in per cent
1918	$5.95	.....	.....	$35.20	+$ 5.20	+17.33
1917	5.95	+$1.50	+33.7	30.00	+ 11.50	+62.2
1916	4.45	+ .70	+18.7	18.50	+ 4.90	+36.0
1915	3.75	.....	.....	13.60	— .40	— 2.9
1914	3.75	— .65	—14.8	14.00	— 3.25	—18.8
1913	4.40	+ .65	+17.3	17.25	+ 3.00	+21.1
1912	3.75	— .75	—16.7	14.25	— .75	— 5.0
1911	4.50	— .50	—10.0	15.00	— 4.00	—21.1
1910	5.00	+ .50	+11.1	19.00	+ 4.25	+28.8
1909	4.50	.....	.....	14.75	— 1.25	— 7.8
1908	4.50	— .50	—10.0	16.00	— 5.50	—25.6
1907	5.00	+ .75	+17.6	21.50	+ 4.25	+24.6
1906	4.25	+ .50	+13.3	17.25	+ 1.75	+11.3
1905	3.75	+ .50	+ 1.54	15.50	+ 2.15	+16.1
1904	3.25	— 1.25	—27.8	13.35	— 8.15	—37.9
1903	4.50	.....	.....	21.50	.....	.....

All Ways Now Filled

The Submarine Boat Corp. April 17 laid the twenty-eighth keel at its shipyard at Port Newark terminal, N. J. The company now has all of its 28 ways in use in the construction of 5500-ton steel freighters for the government. Henry R. Sutphen, vice president of the Submarine Boat Corp., announced that the number of men employed at the plant would be increased to 15,000, and that when the maximum capacity is reached, a complete ship will be produced every two working days.

Gambling Evil Increases

In many manufacturing establishments in England, gambling is prevalent and the evil is on the increase particularly in Sheffield. Plant managers have gone to court, but in view of the time and trouble that it involves, are endeavoring to deal with the proposition themselves. To some extent the practice gained impetus through the introduction of men from other trades as "dilutees" and while executives are at a loss to know what to do to correct the tendency, they are appealing for the development of a strong public opinion to eliminate the vice.

Speeding Up Brings Tool Business

Momentum Imparted to Munitions Work and the Continuing Development of Shipbuilding Supplies a Large Aggregate Volume of Machine Tool Inquiries—Additional Business is Expected from Impending Shell Orders

INCREASED momentum impelling the ship construction program and the urgent demand for more speed on all classes of munitions work have furnished the dominant force back of machine tool requirements during April. A number of new shipbuilding companies have entered the field, and others have brought their preliminary work to the point where new equipment was made necessary by additional contracts from the Emergency Fleet corporation. The requirements of the yards are varied, ranging from drills, lathes, etc., for the plate shops at the yards to a wide range of pneumatic tools, and welding apparatus used in assembling the fabricated ships. Cranes, however, form the major item in the needs of shipbuilding up to the present. The American International Shipbuilding Corp., Philadelphia, has been a steady purchaser of various types and sizes of cranes, and during April placed twenty-four 10-ton and four 35-ton locomotive type gantries with the McMyler Interstate Co., Bedford, O. An additional requirement of 30 cranes is at present in the market from the same company. The stupendous proportions of modern shop and shipyard work, involving the problems of handling and placing heavy equipment has resulted in the construction of cranes far surpassing any previously conceived.

War Work Gives Impetus to Market

A CONCERTED effort has been apparent to speed production in all classes of war work. Whether this has been the logical result of the developing war program, or an industrial reaction from the hammering of the German drive, the machine tool situation has been materially affected. While no exceptionally large requirements have come on the market during April, a steady demand has been noted from those manufacturers who are already actively engaged in munitions work. In a number of instances the pressure applied to speed up has resulted in duplicate orders for a large share of the equipment in active shop use at the present time. In other cases, a few individual tools have been inquired for to be used where they would be effective in increasing output. The request for speed on motors for airplanes has had an appreciable effect and has been reflected in the machine tool market. Liberty motors have supplied a share of this impetus, and the undertaking of new contracts for Hispano-Suiza, and Rolls-Royce airplane motors have furnished an inquiry for equipment which is in most cases, however, supplementary as contracts have been placed with established and operating concerns.

Miscellaneous Subcontracts Furnish Steady Demand

A WIDE distribution has obtained with reference to orders for shells and guns which had previously been alloted in quantity. Subcontract work absorbed by smaller concerns has resulted in a steady demand for small lots of tools which while insignificant individually has furnished a large volume of machine inquiries in the aggregate. The middle west has profited in particular by this class of inquiry, and machine shops even in the smaller communities have absorbed a volume of munitions work which in turn has furnished tool business. In the larger centers a few sizable contracts have made their appearance and lists have been put out. The Standard Steel Car Co., Hammond, Ind., the Willys-Overland Co., Toledo, O., and the Pullman Co., Pullman, Ill., have furnished the largest individual requirements in the central west during the past month. In the Detroit, Dayton, O., and Cleveland districts and from points throughout Ohio, Indiana, Michigan and Illinois there has been a steady volume of small-lot orders. Moline, Rock Island and Davenport forming a tri-city group on the Illinois-Iowa line are developing an important munitions center. The Rock Island arsenal has been given a further appropriation, but has not issued a list up to the present. The Japanese navy is inquiring for a number of miscellaneous tools.

Deliveries Show Little Improvement

LABOR shortage is the prime reason for the fact that deliveries continue slow on many classes of machine tools. Large lathes and boring machines are particularly difficult to obtain. The best that can be done on some makes of these machines is six months, while in some cases the earliest delivery is from eight to 10 months. Milling machines except for specials show some improvement and small lathes and drills appear plentiful. Prices have been advanced on shapers and lathes and a general upward trend is predicted. Dealers handling milling machinery exclusively, however, expect little advance in this line before the first of next year. In general price advance has been in accordance with the increase in labor and material costs. Machine tools for private commercial purposes are becoming increasingly difficult to obtain. Even the railroads are finding the problem of necessary replacements hard to meet. One mechanical engineer for a middle western division reported ordering a wheel and axle lathe for a shop where a replacement was badly needed. The order was accepted but when an inspector for the company called to accept the tool, he found that it had been taken for use in the locomotive works built for the government in France. In general, machine tool dealers welcome the offices of the government in assigning or designating equipment for urgent government work, as it removes the responsibility when old customers must wait.

Large Volume of Shell Work is Expected

WITH the huge tonnage of shell steel now going to the mills, machine shop activity on finishing work is anticipated. Considerable of this shell work it is anticipated will be handled by western companies, and will necessitate a great amount of additional machinery and equipment. Forging capacity for this will involve the purchase of a large number of heavy presses, and some inquiries are already in the market. During the past week the government has awarded some heavy shell work to Canadian companies already equipped to handle such work. Heavy gun manufacture is receiving attention, and plans looking to the establishment of an ordnance manufacturing plant larger than either the Watertown or Watervliet arsenals are under consideration. When this plan is carried out, an unprecedented demand for heavy equipment is anticipated.

Tool Market Shows Temporary Lull

Light Buying Reported From All Districts—Miscellaneous Small Lot Inquiries Continue to Bridge the Gap Preceding Large Requirements Which Are Expected From Impending War Contracts

THE present lull which marks the machine tool situation this week has been aptly likened to the deep inhalation which precedes the plunge into an active market to result from the volume of war orders in sight. No large lists have emanated recently, but some of the requirements which have been noted from time to time are as yet unclosed. The Wright-Martin Aircraft Corp., New Brunswick, N. J., has awarded some tools, but the greater part of its requirements still are open. The government will place orders soon for a number of miscellaneous tools, which are required for navy yard and arsenal work. An appropriation has been given to the Rock Island arsenal for new equipment, but up to the present time no list has been issued. Dealers in general state that a fair volume of business obtains, but the replacement orders and the inquiries for small lots are not as plentiful as during the past few weeks. The immediate future, however, seems to promise an active demand. The shell steel which is going through the mills will demand a large amount of forging equipment. As it proceeds through the finishing processes, much additional machinery will no doubt be essential, as speed of production will be the governing factor. With the machinery resources of the country at present fully engaged to capacity, and with the pressure for increased output, this new shell manufacture will prove a burden to be met only by additional facilities. Some heavy projectile work has been awarded in Canada. Deliveries are still slow on a number of machines, notably shapers and heavy boring machines, but in other lines an improvement is noted. Inquiries for drills, and lighter lathes and shears, are being promptly supplied. The demand for cranes shows an increase due to the activity along shipbuilding lines. Cranes for terminal service and in a number of foundries and machine shops handling government work also are in more active demand. Hoisting and conveying machinery is expected to be active as a result of the educational campaign having for its object the summer storage of next year's coal.

Sub-Contractor and Shipyards Furnish Inquiries

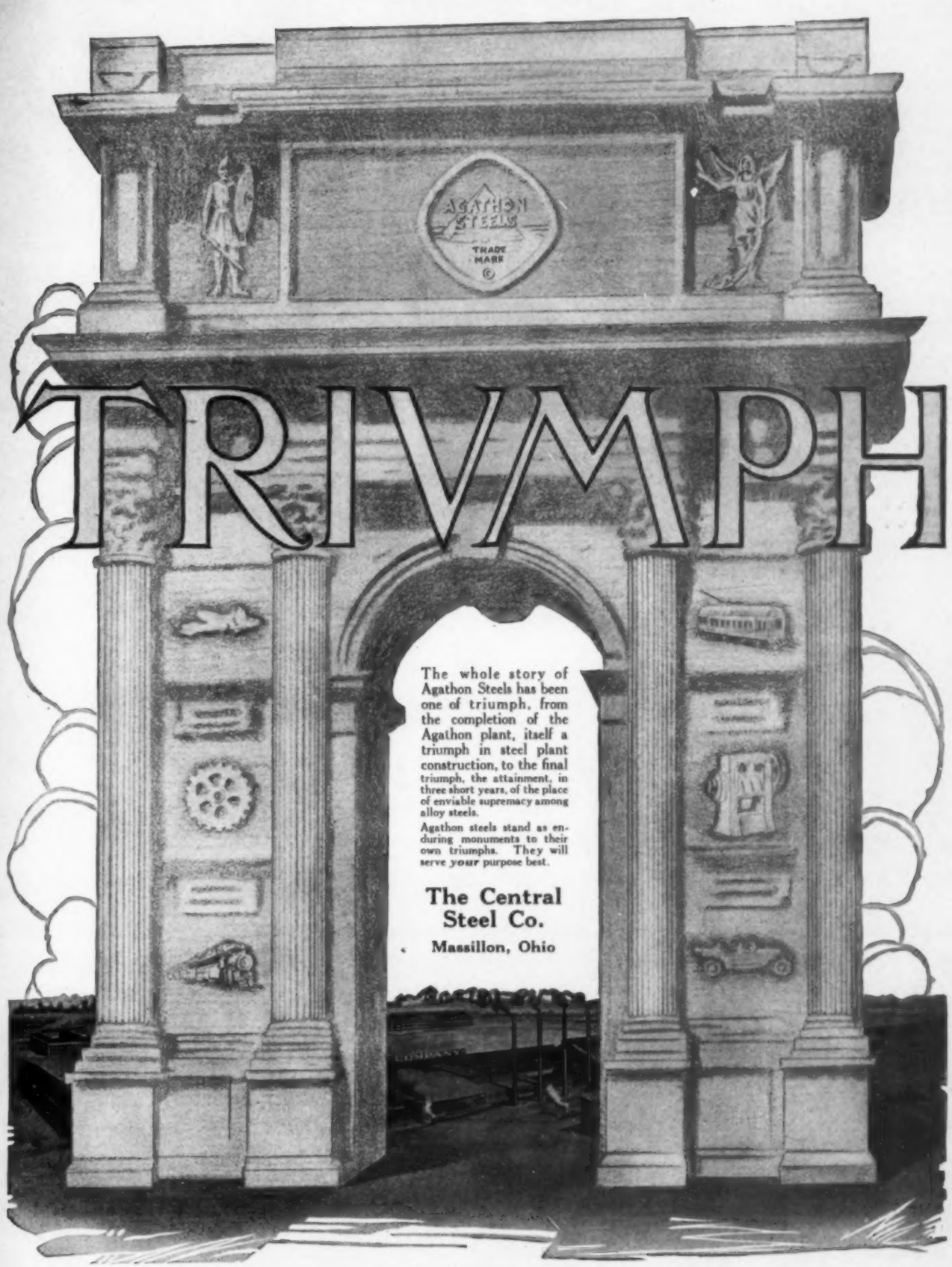
WITH miscellaneous demand now assuming better proportions, eastern machine tool dealers are viewing the situation in the equipment market with more optimism. During the past week a considerable improvement from manufacturers of brass specialties has been noted, and inquiry from shipbuilders and companies holding government subcontracts has been of more substantial volume. A development of much interest, and one which is expected to result shortly in considerable new business, was the award by the government this week of several large contracts to Canadian companies for the production of 12-inch shells. These, it is stated, are soon to be followed by contracts for 14 and 16-inch projectiles. Several companies in this district are figuring on equipment in anticipation of further shell contracts. The American Can Co., it is understood, has already started purchasing tools needed in this work for its plant at Edgewater, N. J.

Wright-Martin List Remains Open

The Wright-Martin Aircraft Corp., New Brunswick, N. J., has recently purchased several grinders and lathes, but has not as yet taken any decisive action on the large list issued several weeks ago. The government is in the market for 62 milling machines for the Washington navy yard. Bids will be opened May 10. Additional tools have been purchased during the past few days for the Watervliet arsenal. Further equipment also is being bought by the Virginia Shipbuilding Co. for its machine shop at Alexandria, Va. It is stated that tentative inquiries for punching and shearing equipment have been put out by the Carolina Shipbuilding Co., which was recently organized by the George A. Fuller Co., New York City, to operate the proposed government plant at Wilmington, N. C. Offices have been established by the Carolina company at 415 Broadway, New York City. The Foundation Co., 233 Broadway, New York City, is expected to act shortly on a sizable inquiry recently issued. The Groton Iron Works, Groton, Conn., is buying a few lathes. With the railroad administration now placing orders for rolling stock, a resumption of buying by car and locomotive builders is expected. Tools needed in the manufacture of mechanical stokers for locomotives will amount to several hundred thousand dollars.

The Morse Dry Dock Co., Brooklyn, has purchased a 1000-ton hydraulic press for its proposed forge shop from the United Engineering & Foundry Co., and is understood to be in the market for some small miscellaneous tools. Included in plant construction now contemplated is $150,000 foundry for the Pratt & Letchworth Co., Buffalo. Work soon will be started by the Crescent Insulated Wire & Cable Co., Trenton, N. J., on a $100,000 addition. Dougherty & Bachran, Philadelphia, will build a $70,000 machine shop. The Continental Can Co., Syracuse, N. Y., is drawing plans for a $60,000 power house. The Arrow Electric Co., Hartford, Conn., will build a large addition to its plant.

Demand for cranes, while an improvement over that of a month ago, continues relatively quiet. An important inquiry out at this time is that of Fay, Spofford & Thorndike, Boston, calling for 30 special cranes for the new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Chicago Office—1370 People's Gas Bldg., 122 S. Michigan Blvd. C. H. Beach, District Representative.

Philadelphia Office—603 Widener Bldg. Frank Wallace, District Sales Manager.

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Say you saw it in THE IRON TRADE REVIEW

government terminal in that city. These cranes will be of the boom type and will range in capacity from 1½ to 2 tons. It is expected that the proposed $40,000,000 government plant to be built at Brooklyn will also require a large number of cranes. The Arthur C. Harvey Co., Boston, dealer in iron and steel products, is contemplating the purchase of three or four traveling cranes. The Gilbert & Barker Mfg. Co., Springfield, Mass., is inquiring for a 5-ton electric loading crane. The Eagan Rogers Steel & Iron Co., Crum Lynne, Pa., is also in the market for a 5-ton electric crane. The Carolina Shipbuilding Co., 415 Broadway, New York City, is making tentative inquiries for conveying equipment for its proposed plant at Wilmington, N. C. It is understood that only electric hoists will be purchased at this time.

Included in business recently placed are eight 35-ton locomotive cranes for the American International Shipbuilding Corp. These are to be built by the Industrial Works, Bay City, Mich., and make a total of 36 cranes to be bought by the American International within the past few weeks. The E. I. du Pont de Nemours Co., Wilmington, Del., has bought a 10-ton electric crane from the Case Crane & Engineering Co., Columbus, O. The Philadelphia Rapid Transit Co., Philadelphia, placed a 15-ton electric crane with Alfred Box & Co., of that city. The Merrill-Stevens Shipbuilding Corp., Jacksonville, Fla., has closed on its recent inquiry for one 25-ton and two 50-ton cranes. It is understood that at least two are used cranes. The government has purchased a 30-ton crane from the Shaw Electric Crane Co., Muskegon, Mich., and a 5-ton used Pawling & Harnischfeger, Milwaukee, crane for its naval base stores in Brooklyn. The Cleveland Crane & Engineering Co., Cleveland, received 17 cranes, including one 100-ton crane, of those recently allotted by the government for the Washington navy yard. A 200-ton electric crane is to be purchased for the gun shop at this yard. The Ludin Steel Castings Co., Neponset, Mass., is expected to close on a 5-ton electric crane this week.

War Requirements Dominate Chicago Market

AS in practically all departments of the iron and steel business, war requirements dominate the machine tool industry in the Chicago district. This is true of the small buying, which forms the larger portion of present activity, as well as in the larger buying which comes out from time to time. The only important cause for adding to machine shop equipment is an endeavor to provide for increased demands by the government, both direct and indirect. The Rock Island arsenal has been given a further appropriation but no list has yet been issued covering the material for which this will be expended. The large list recently issued by the Burlington railroad is still open and nothing definite has been done during the past week. The Winslow Bros. Co., Chicago, which has a large munitions order, has been a heavy buyer of equipment but has covered all its needs for its present plant. The Davenport Mfg. Co., Davenport, Iowa, which recently took a government contract, has bought considerable general equipment and has covered its present requirements. The Hackett Motor Co., Grand Rapids, Mich., will build a plant to manufacture gasoline engines. The Astoria Marine Iron Works, Astoria, Oreg., will build a machine shop, foundry and forge shop. The Hall-Scott Motor Co., Berkeley, Cal., is adding to its plant to enlarge its production of war motors. The Climax Engineering Co., Clinton, Iowa, will build a machine shop. The United States Auto Gear Shift Co., Eau Claire, Wis., is building a four-story shop. The Liberty Foundry Co., Portland, Oreg., is building a foundry and machine shop for which new equipment will be required. An addition is under construction at the plant of the Diamond T Motor Car Co., 4517 West Twenty-sixth street, Chicago, for which considerable equipment will be purchased.

Comparative Quiet Prevails in Cleveland Market

A DIMINUTION of the volume of single inquiries is noted in the vicinity of Cleveland, and few lists are out. Dealers, however, are optimistic and assign the condition to a breathing spell previous to orders which are anticipated from government work in sight. Used tool and supply men report more inquiries than they are able to handle as little equipment is being disposed of at the present time. Heavy tools in particular are wanted in many quarters. It is stated that the Japanese navy is in the market for miscellaneous machines including engine lathes, milling machines, boring mills, slotting machines, radial drills, planers and some horizontal boring machines. The Miami Machinery Co., Toledo, O., is inquiring for milling machines and a shaper. The Michigan Malleable Mfg. Co., Detroit, will purchase a large pulley lathe. The Sharon Hardware Co., Sharon, Pa., are in the market for a surface grinder.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

AUGUSTA, ME.—The Towar Textile Mills Corp. has been incorporated with $2,500,000 capital by E. Maynard Thompson, L. A. Stevens and I. S. Kearney.

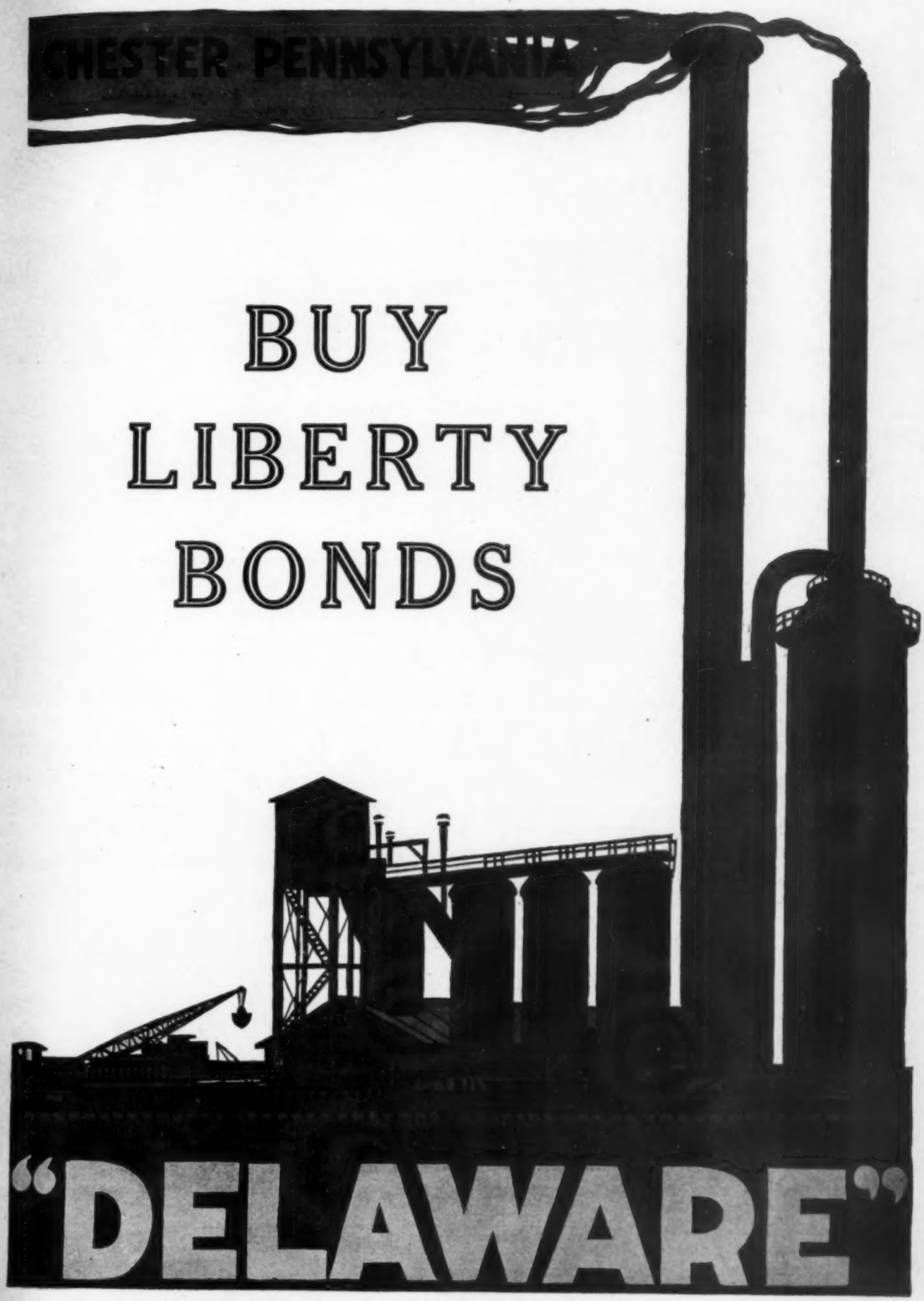
BRUNSWICK, ME.—The Texas Steamship Co., of Bath, Me., has acquired the title to a track of land of about 7½ acres at Hardings, which will be used for a freight yard and the storage of raw materials. The land is being graded and double tracked so it can be put to use within a short time. Most of the material to be stored is steel.

BUCKSPORT, ME.—A New York syndicate has purchased property on the Penobscot river and will establish a shipyard under the name of the Penobscot River Shipbuilding Co. It will make ocean-going tugs.

OLDTOWN, ME.—The foundry of the machine shop of the T. M. Chapman's Sons' Co. was damaged by fire April 15.

PORTLAND, ME.—The plant of the Bancroft & Martin Rolling Mills Co. has been sold to interests identified with the Cumberland Shipbuilding Co. It will be operated in co-ordination with the Cumberland plant, which will later be enlarged by the erection of several new buildings.

PORTLAND, ME.—At the annual meeting of the Maine Central railroad stockholders voted to leave the matter of a $3,000,000



Say you saw it in THE IRON TRADE REVIEW

bond issue in the hands of directors, with authority to act when they see fit. The money will be used largely for new equipment.

BENNINGTON, VT.—The Holden, Leonard Co., woolens and worsteds, is completing a 4-story building to hold five sets of carding machines and spinning machinery of equivalent capacity; also 20 broad looms.

BEVERLY, MASS.—The Reid Bros. Co. has been incorporated to manufacture machinery and tools with $20,000 capital by Robert Reid, Andrew S. Reid and F. H. Leonard.

BOSTON.—The Mosstwin Co. has been incorporated to manufacture fasteners of all kinds with $150,000 capital by Isidor Moss, Louis J. Stern, Mattapan, Mass., and I. R. Bailie.

BOSTON.—The Utilities Mfg. Co. has been incorporated with $200,000 capital by Richard J. Reeves, Arthur C. Putnam and W. S. Douglas.

BOSTON.—Edgar T. Ward & Sons, South Boston, have awarded the general contract for the construction of a 1-story addition to their annealing shop.

BOSTON.—The Premier Machine & Press Co. has been incorporated to manufacture machinery, with $1,000,000 capital, by Fisher H. Nesmith, Cambridge, Mass.; J. S. Stone, Wayland, Mass., and Alexander G. Grant.

CAMBRIDGE, MASS.—The Worthington Pump & Machinery Corp. as agent of the United States government, has let the contract for a brick and structural steel, 1-story, 140 x 140 x 59-foot factory to cost $35,000 on Rogers street.

CAMBRIDGE, MASS. — The Cambridge Electric Light Co. has let the contract for a brick and stone, 1-story, 44 x 69-foot extension to its boiler house on Western avenue, to cost $20,000.

CHICOPEE, MASS.—The Page Needle Co. has been incorporated with $300,000 capital by W. S. Page, Irving H. Page, Chicopee Falls, Mass.; and C. O. Orne.

EAST CAMBRIDGE, MASS.—The oil storage plant of the Alden Speare's Sons Co. was damaged to the extent of $100,000 by fire, April 15.

EAST LONGMEADOW, MASS.—The New England Castings Co., recently incorporated with $99,000 capital has acquired the stone cutting plant of the Norcross Brownstone Co., Worcester, Mass., and will make small, high grade steel castings by an electrical process.

FAIRHAVEN, MASS. — The Fairhaven Shipbuilding Co. has been incorporated with $150,000 capital by C. G. Whiton, David L. Kelley and I. N. Babbitt.

FALL RIVER, MASS.—The Narragansett Shipbuilding Co. has been incorporated with $150,000 capital by H. C. Wood, Westfield, Mass.; A. B. Murdough, Watertown, Mass., and H. J. Ashe, North Adams, Mass.

FRAMINGHAM, MASS. — The Framingham Forge Co. has been incorporated with $25,000 capital by James S. George, William B. Arnold, Newtonville, Mass., and H. H. Ballard Jr.

FRAMINGHAM, MASS.—A stone church will be erected at the corner of Concord and Lincoln streets, here, for the Framingham Methodist Episcopal society. The building will be 60 x 100 feet and cost about $40,000. John Ferguson, Boston, has the contract for the building.

HYDE PARK, MASS.—The Mason Regulator Co. will build a reinforced concrete, fireproof, 3-story, 80 x 160-foot factory on Hyde Park avenue.

MAYNARD, MASS.—The Concord, Maynard & Hudson Street Railway Co. has let the contract for a brick, 1-story, 150 x 78-foot car barn at Main street and Great road, to cost $20,000 and to replace that recently burned.

NEW BEDFORD, MASS. — An addition will be erected at the plant of the Continental Wood Screw Co., plans for which are being drawn by C. Hammonds & Son.

NORTH ATTLEBORO, MASS.—A 2-story brick high school building will be erected on South Washington street at a cost of $200,000. The building will be 117 x 160 feet. The contractor is J. A. Monroe, of this town.

PEABODY, MASS.—The A. C. Lawrence Leather Co. will build a reinforced concrete, 7-story and basement, 90 x 80-foot, extension to its storage building at Crowninshield and Endicott streets.

SAUGUS, MASS.—A public library for this town has been started. The building, which will be 1-story, of brick and stone, fireproof, 75 x 25 feet, will cost $15,000. Edward D. Dearborn, Lynn, is the general contratcor.

SOMERVILLE, MASS. — The American Tube Works has let the contract for a brick, 1 and 2-story, 49.11 x 29.3-foot machine and blacksmith shop at 440 Somerville avenue.

SOUTH SOMERSET, MASS. — The Crowninshield Shipbuilding Co. will build a reinforced concrete, 1-story, 75 x 100-foot machine shop and let the contract for a marine railway of 2500 tons ship capacity.

SPRINGFIELD, MASS. — Tremblay-Hathaway, Inc., has been incorporated to manufacture automobiles, trucks, etc., with $50,000 capital by D. J. Tremblay, Theodore B. Hathaway, Fall River, Mass., and A. B. Hathaway.

SPRINGFIELD, MASS.—The Moses Ehrlich Iron & Coal Co., Inc., has been incorporated with $85,000 capital by Moses Ehrlich, H. M. Ehrlich and Simon Ehrlich.

WORCESTER, MASS.—The M. D. Holmes & Sons Co., steamfitter and plumber, will build a brick, 4-story and basement, 100 x 50-foot office, show room and warehouse building at Portland and Federal streets.

WORCESTER, MASS.—The United Toy Mfg. Co. has been incorporated with $20,000 capital by Solomon Stayman, Jacob L. Goding and Louis Nestor.

WEST SPRINGFIELD, MASS. — Plans are being drawn for an 80 x 370-foot addition to its factory and a concrete 370-foot long loading platform for the Gilbert & Barker Mfg. Co. on Cold Spring avenue.

WORCESTER, MASS.—The B. F. S. Mfg. Co. has been formed to manufacture electric valve grinders and special machinery at 54 Hermon street, by Bror F. Stenman, Carl W. Fors, Charles E. Mattson and J. Henry Lindberg.

PROVIDENCE, R. I.—The town of East Providence has granted the necessary permits for the erection by the Standard Oil Co. of New York of 300 oil tanks, of all sizes, and buildings for a distributing station to be located there.

PROVIDENCE, R. I. — The Greenwich Mill at East Greenwich, has awarded the contract for a weave shed addition, construction of which is to commence immediately. The building is to have temporary wooden ends to permit of further expansion. The company has ordered twenty-four 82-inch worsted looms to be installed in the addition.

HARTFORD, CONN.—A plant to cost about $100,000 to extrac toluol from the city's gas supply will be erected immediately near the Hartford City Gas Co.'s works, under the supervision of government officials. It is estimated that the new plant will produce about 50,000 gallons of toluol a year. It is reported that similar plants will be erected soon in New Britain, Meriden and Middletown.

NEW BRITAIN, CONN.—Landers, Frary & Clark will build a brick, 2-story, 45 x 227-foot addition to its factory on Center street, to cost $35,000.

NEW HARTFORD, CONN.—The factory of the Standard Brush Co. was damaged by fire, April 11, with a loss of $50,000. It was engaged on government contracts.

NEW LONDON, CONN.—A $13,000 machine shop will be built by the navy department in this city.

SPRINGDALE, CONN. — The British-American Mfg. Co. has let the contract for the erection of a 60 x 200-foot, one-story, factory addition. When this building is completed, another 50 x 100 feet will be erected. The estimated cost of the two buildings is about $125,000.

STAMFORD, CONN.—The Stamford Electric & Mfg. Co., which recently completed a 2-story factory in this city, now plans to enlarge this building, and also erect another structure of similar proportions.

Trade Announcements

The American Zinc Products Co., Greencastle, Ind., has opened an office in Chicago, 1029 *McCormick building, with D. S. Oskin as western sales representative. He formerly was sale manager for the Trumbull Steel Co., Warren, O.*

E. Kaufman & Co., Farmers Bank building, Pittsburgh, dealers in high grade steel and alloys, will move into larger quarters of the same building on May 1.

The Federal Machinery Sales Co., of 12 *North Jefferson street, Chicago, has opened a branch office at* 1320 *Majestic building, Milwaukee, under the supervision of H. L. Cole. After May* 1, *the business of Clarke & Harrison, machinery and equipment, will be conducted under the name of George W. Clarke Co.,* 149 *Broadway, New York. The Ott Grinder Co., Indianapolis, Ind., has purchased the controlling interest held by Albert J. Ott and his son Conrad. Russell Fortune is general manager.*

The Sprague Electric Works of the General Electric Co. has removed its Boston office from 201 *Devonshire street to* 84 *States street.*

D. J. Crowley, manufacturers' representative, has removed from 183 *Whitney avenue to* 823 *Dime Bank bulilding, Detroit.*

A PERFECT START—
A PERFECT FINISH
A successful offensive manoeuvre must gain its objective. Tanks, planes, and motors must be able to make a perfect finish as well as a perfect start. They must have, not only power and endurance enough to buck the inferno of a modern defence, but also reserve power enough to carry them through to the victory.
Vehicles of war or peace, in order to gain their objective—in order to give the satisfaction or produce the results for which they were intended, must have invulnerable vital parts.
Whether you are manufacturing Tanks, Airplanes, Motor Trucks, Automobiles, Farm Tractors or other farm machinery you should have castings of a quality and strength fit for that particular service.
The Ohio Steel Foundry Co.
Plants
Springfield, Ohio Lima, Ohio Bucyrus, Ohio
Quality PLUS Service

Along the Middle Atlantic Seaboard

BATAVIA, N. Y. — The Massy Harris Harvester Co. will start work shortly on the construction of a 1-story warehouse, 144 x 168 feet.

BINGHAMTON, N. Y.—C. E. McGill is having plans prepared for a $15,000 machine shop.

BROOKLYN, N. Y.—Julius Kayser & Co., 45 East Seventeenth street, New York City, have awarded the general contract for a $30,000 factory building to the White Fireproofing Construction Co.

BROOKLYN, N. Y.—A $45,000, 4-story factory building will be erected by Cornelius Wiess, 226 Henry street. Carlson & Weisman are architects in charge of the work.

LONG ISLAND CITY, L. I., N. Y.—Plans are being drawn for warehouses at the new barge canal terminal in this city by Frank M. Williams, state engineer, Albany, New York.

MOHAWK, N. Y.—Frank M. Williams, state engineer, Albany, N. Y., is drawing plans for a hydraulic power plant, which is to be erected in this city.

TOMPKINSVILLE, S. I., N. Y.—A $95,000 machine shop will be erected here shortly by the government ,this being one of the items mentioned in the lighthouse bill which was recently favorably reported in congress.

AMBRIDGE, PA. — The Parker Woolen mills, Second National Bank building, let a contract to Kemena and Ehrheart, Eleventh and Melrose streets, for a $25,000 addition to its plant.

LITITZ, PA.—H. B. Workman & Co., manufacturer of halters, trunk straps, and other webb goods, on Pine alley, this city, has arranged to build a 2-story addition, 25 x 50 feet to its plant, this city.

PITTSBURGH.—The South Pittsburgh Water Co., 238 Brownsville road, let a contract to Walker & Curley Co., East End Savings and Trust building, for a 1-story addition, 48 x 118 feet to its power plant.

POTTSVILLE, PA.—The Bob & Baskind Co. will double its capacity of the factory at Railroad and Morris streets. Mr. Dubinsky is manager.

WARREN, PA.—The Ill Will Creek Oil & Gas Co., capitalized at $30,000, to operate wells in the state of Kentucky, was chartered by S. E. Pryor, W. J. Eagan, A. Krupp, George A. Krupp, George B. Brenneison, Warren; and X. L. Conn, Meadville, Pa.

BELLEVILLE, N. J.—Lloyd Chemical Co. will erect several 3-story brick buildings on Holmes street to cost $2,000,000.

CAMDEN, N. J.—Standard Projectile Boring Machine Co. has been chartered with $100,000 capital to manufacture projectile machines. Samuel S. Williams, W. W. Williams and Edward L. Parker are the incorporators.

CLIFTON, N. J.—Clifton Milling Co. will erect a 4-story concrete factory to cost $250,000.

HARRISON, N. J.—Plans are being drawn for the erection of a $50,000 addition to the plant of H. R. Worthington Co. The Austin Co., Philadelphia, will be in charge of the work.

JERSEY CITY, N. J.—DeRosa & Pereira, New York City, has awarded a contract to I. A. Hoppers Sons, New York, for a 2-story factory addition on Hudson boulevard to cost $100,000.

NEWARK, N. J.—A power house 40 x 60 feet in size, to cost $9000, will be erected at the plant of the Northern Leather Works & Products Co. E. Havemann is president, with offices at 377 Broadway, New York.

NEWARK, N. J.—De Meese & Heyman, Inc., has been incorporated with $10,000 capital to manufacture engines, etc. Fred De Meese, I. E. Heyman and Emanuel Heyman are incorporators.

NEWARK, N. J.—Simmons Co. has been chartered with $13,000,000 to manufacture mattresses, etc. Z. G. Simmons, A. H. Lane and George H. Milne, all of Kenosha, Wis., are the incorporators.

NEWARK, N. J.—Martin Dennis Co., 170 Sylvan avenue, will erect a 1 and 2-story brick and steel factory, 82½ x 125½ feet in size, to cost $29,401.

NEWARK, N. J.—Oxweld Acetylene Co., 646 Frelinghuysen avenue, will erect a 1-story steel storage house, 40 x 100 feet in size.

PLAINFIELD, N. J.—International Motor Co. has awarded a contract to F. T. Ley & Co., New York, for a 4-story addition, 78 x 288 feet in size, to cost $200,000.

TRENTON, N. J.—William R. Thropp Sons Co., East State street, is rebuilding its burned machine shop and pattern shop and is in the market for planes and other machinery. Joseph W. Thropp, secretary-treasurer.

FORT PENN, DEL. — It is understood that the ordnance bureau contemplates the erection of a plant in this city.

WILMINGTON, DEL.—New bids are being received by Architect George F. Pawling on a foundry, pattern storage shop and pattern shop addition, costing in all $200,000, for Pusey & Jones.

BALTIMORE.—Work will soon be started on a $100,000 boiler house for the Consolidated Gas & Electric Power Co.

BALTIMORE.—Bids are being received by Architect Joseph Evan Sperry for a $50,000 addition for Mt. Vernon Woodberry Mills, Inc.

BALTIMORE. — A $100,000 coal tipple will be erected by the United States Industrial Chemical Co.

Activities in the Central States

APPLETON, WIS. — C. D. Thompson, secretary, Industrial School board, took sealed bids until April 22 for the construction of the first unit of the new vocational training institute. The unit will be three stories high, 100 x 100 feet, of reinforced concrete, brick and steel, and was designed by Architects Child & Smith, 1261 Peoples Gas building, Chicago. The estimated cost is $85,000, including manual training and other equipment.

ASHLAND, WIS.—The L. E. Meyers Co., 58 West Jackson boulevard, Chicago, has been awarded the general contract to design and construct a $100,000 hydro-electric power plant for the Ashland Light, Power & Street Railway Co. at Superior Falls, Wis. Preliminary work now is under way.

BARABOO, WIS.—The Protheroe & McGinnis Auto Co., manufacturer of hoisting apparatus for motor dump trucks, will build an addition to its machine shop.

GREEN BAY, WIS.—Hudson & Sharp, 1207 Main street, will build a 2-story machine shop to cost $95,000. C. H. Williams is architect.

EAU CLAIRE, WIS.—The Gillette Rubber Co., tire manufacturer, has awarded the following contracts for the erection of a 2-story brick and steel addition, 65 x 145 feet in size: Steel, Northwestern Bridge & Iron Co. and Lakeside Bridge & Steel Co., Milwaukee; mason and concrete, R. L. Rickman, Eau Claire; elevators, Kieckhefer Elevator Co., Milwaukee. Edward Hutchens is vice president and chief engineer.

MADISON, WIS.—The Madison-Kipp Lubricator Co., manufacturer of lubricating devices, is building an addition for light machine work and assembling to cost $35,000.

MADISON, WIS. — The Municipal Appliance Co., capitalized at $150,000, has been chartered to manufacture direction signals, by H. R. Martin, A. R. Earle, and L. B. Martin, of Edgerton, Wis.

MARATHON CITY, WIS.—Architect H. T. Liebert, Wausau, Wis., is taking bids for the erection of a $200,000 monastery, 150 x 170 feet, two stories and basement, at Marathon City for the Province of St. Joseph, Capuchin Fathers.

MILWAUKEE.—The Harley-Davidson Co., 160 Clinton street, manufacturer of motorcycles, will build a plant at Fortieth and Chestnut streets, to cost $50,000.

MILWAUKEE.—The J. C. Thielacker Co., capitalized at $10,000, has been chartered to manufacture architectural and ornamental iron work by Benjamin J. Sommers, George G. Cromlie and Julius C. Thielacker, 937 Twenty-second street.

MILWAUKEE. — The Milwaukee-Western Fuel Co., Milwaukee, through Klug & Smith,

Service And Growth

FEDERAL EXPORT BUILDING
42 BROADWAY NEW YORK

The character of service given by the Federal Export Corporation has increased its business to a point where larger headquarters were necessary; hence the Federal Export Building at 42 Broadway, New York, where more space is available for the immediate needs of the organization and its future expansion provided for.

The steady growth which has attended this international trading corporation is sufficient evidence to guarantee greater activities in the future—activities that will carry forward American prestige and place demand for American products on a permanent basis.

The "Fedex" organization at headquarters includes a number of men who have lived and traveled in the principal trading countries of the world and are able to advise manufacturers of true conditions there and the best methods of meeting them. The "Fedex" organization abroad is made up of men chosen for their ability to produce business and their willingness to co-operate in making our service satisfactory to both the foreign buyer and the American producer.

Call or write and let us tell you how we may bring foreign demand to your factory doors.

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42 BROADWAY - - - NEW YORK

WATERTOWN, WIS. — The Monarch Tractor Co. will build additions to its machine shop and assembling building to cost $20,000.

WEST ALLIS, WIS.—The Universal Machinery Co., E. C. Devine, president, 784 Thirtieth street, will build a factory 150 x 250 feet, a foundry 100 x 150 feet, and a power house 50 x 50 feet to cost $250,000.

DETROIT.—The Ford Motor Co. is building a plant for the assembly and testing of the Liberty motor. The addition comprises 16 shops, 18 x 360 feet, and will form an extension to its Highland Park plant.

RACINE, WIS. — The Jos. Miller Shoe Co. will erect a 3-story fireproof factory addition, 42 x 110 feet, costing $50,000 complete, to provide facilities required to handle government orders for army shoes. The power plant also will be enlarged. The work is in charge of Architect Albert S. Hecht, 143 West Randolph street, Chicago.

SUPERIOR, WIS.—Bids for the construction of a new courthouse and county jail costing $400,000 at Superior, Wis., are being received until May 13, at 2 p. m., by the building committee of the Douglas county board of supervisors at the office of E. S. Radcliffe, architect, Superior, and Associate Architect J. W. Royer, Urbana, Ill. As previously noted, the building will be of stone, brick, steel and concrete, 200 x 175 feet, three stories and basement. W. J. Leader is county clerk.

CAIRO, ILL.—The Tideman Electric Mfg. Co. is building a plant at Cairo.

CHICAGO.—The Diamond Motor Car Co., 4517 West Twenty-sixth street, is building a machine shop.

CHICAGO.—The North American Railway Construction Co. has increased its capital stock from $100,000 to $250,000.

CHICAGO. — The Lonergan Cutting Die Co., 4517 Lexington street, will build additions and install machinery.

CHICAGO.—The Reliance Die & Stamping Co., 501 North La Salle street, manufacturer of dies, gages and jigs, has increased its capital and will install additional equipment.

CHICAGO.—R. C. Wiebold, 1534 West Van Buren street will build a 7-story factory, 77 x 150 feet, at Ashland avenue and Van Buren street.

CHICAGO.—The International Harvester Co., 606 South Michigan avenue, is having plans prepared for foundry buildings at Thirty-first and Rockwell streets, to cost $1,000,000. Pruch & Perrine, Keystone building, Pittsburgh, are architects and engineers.

CHICAGO.—The Benjamin Electric Co., 126 South Sangamon street, will build two 1-story factory buildings, 76 x 100 feet and 80 x 192 feet, at Des Plaines, Ill.

CHICAGO.—The Standard Forging Co., East Jackson boulevard, will build an engine house and other buildings in connection with its plant at Indiana Harbor, Ind., to cost about $15,000.

ELGIN, ILL.—The Woodstock Typewriter Co. has increased its capitalization to $1,000,000 and will build an addition.

GRANITE CITY, ILL. — The Commonwealth Steel Co., Pierce building, St. Louis, will build a 1 and 2-story addition to cost $500,000.

KANKAKEE, ILL.—The American Truck & Aeroplane Co. has bought the plant of the Unifile Co., at Riverview, Ill., and will equip it for automobile motor trucks and airplanes.

MOLINE, ILL.—Deere & Co. has let contracts for four reinforced concrete factory buildings, 40 x 65 feet, 60 x 200 feet, 75 x 200 feet and 80 x 200 feet, to cost $300,000.

OTTAWA, ILL.—The Ottawa Pianophone Co., Joliet street, will rebuild its burned plant at a cost of $100,000.

ROCK ISLAND, ILL.—The Rock Island Bridge & Iron Works will build a $3000 addition to its shops.

ROCKFORD, ILL.—Bids will be taken this summer for a reinforced concrete bridge over Rock river at Main street to cost $100,000. C. Olden, state bridge engineer, Springfield, is in charge.

SPRINGFIELD, ILL.—The Lipman Refrigerator Car & Mfg. Co., South Beloit, Ill., has certified to an increase in capital stock from $12,000 to $60,000.

FT. WAYNE, IND.—The American Fuel Saving Engineering Corp., capitalized at $1,000,000, has been chartered to manufacture smoke-consuming and fuel-saving devices, by Bruce M. Wylie, Austin W. Stutz and Charles H. Hall.

HAGERSTOWN, IND. — The Teetor-Hartley Motor Corp., capitalized at $1,000,000, has been chartered to manufacture motors and metal devices by Charles N. Teetor, Ralph R. Teetor and Frank M. Tatman.

HAGERSTOWN, IND.—The Indiana Piston Ring Co., capitalized at $100,000, has been chartered to manufacture metal products by Charles W. Teetor, Ralph R. Teetor, Henry W. Keagy and Blair Hartley.

HAMMOND, IND.—The Liberty Tractor Co., capitalized at $50,000, has been chartered to manufacture tractors and farm implements by Max Salmon, Herman Rettig, Frank E. Gossett and Cornelius Moor.

HUNTINGTON, IND.—The wrecking of the Cincinnati, Bluffton & Chicago railroad has begun, the final efforts of different parties to reorganize the company and to resume business having failed. G. W. Farmer will superintend the dismantling. Herman Sonken, Huntington, Ind., is the present owner of the property.

INDIANAPOLIS.—The C. Fussner Mfg. Co., capitalized at $150,000, has been chartered to manufacture machinery by Peter F Fussner, Harry B. Cobb and Charles J. Fussner.

INDIANAPOLIS. — The Will-Do-It Mfg. Co., capitalized at $10,000, has been chartered to manufacture metal containers by Darwin A. Medaris, Edward F. Jones and Harvey W. Taylor.

KOKOMO, IND.—The Standard Sanitary Mfg. Co. will build a warehouse, 100 x 120 feet, to cost $35,000. Dunlap & Co., Kokomo, are architects.

LOOGOOTEE, IND.—The Loogootee Face Brick & Tile Co. has changed its name to the Loogootee Fire Clay Products Co.

MARION, IND.—The Bollstrom Motors, Inc., will build a plant to cost $3,000,000.

RICHMOND, IND. — The Empire Brass Foundry Co. has been incorporated with capital of $10,000 to manufacture metal products. Albert C. Hurell, James E. Jones and Joseph H. Hill are the directors.

TERRE HAUTE, IND.—The Up-to-Date Mfg. Co., manufacture of wire fencing and fire escapes, will rebuild its burned plant.

TERRE HAUTE, IND.—The Rott Glass Co. will build an addition to its machine shop. Johnson & Miller, 105 South Seventh street are architects.

DAYTON, O.—Farrell, Stoneham & Thompson Co. has been incorporated with a capital of $6000 to manufacture tools and special machinery. The incorporators are James P. Farrell, Walter A. Stoneham, William A. Thompson, W. S. McConNaughey and Jay Leach.

CENTERTOWN, KY. — Centertown Coal Co., P. O. McKinney, president and general manager, has started development work on 1700 acres of coal property, planning daily production of 3000 tons. Capital amounts to $160,000. Part of machinery requirements has been placed.

LEXINGTON, KY.—Marion Coal Co., to operate mine property at Indian Bottom, has placed orders for machinery for electrically operated coal mining plant, 1000 tons daily capacity. Harry R. Smith is manager.

LOUISVILLE, KY.—Charles Powell, head of Powell Coal Co., capital $300,000, will install electrically-operated mining plant, costing about $250,000, including mining town, tipple, etc. The company has a capital of $300,000 and several thousand acres of coal land under lease.

MADISONVILLE, KY.—The O. & R. Coal Co., recently incorporated, capital $20,000, will build a tramway to connect its mine with Louisville & Nashville railroad.

WINCHESTER, KY. — The Cumberland Pipe Line Co. is building several miles of additional oil carrying lines in eastern Kentucky, and has placed heavy orders for 2, 4 and 6-inch pipe, pumps, compressors, etc., but will require some additional equipment.

Western and Intermountain Territory

DULUTH.—The Modern Cotton Machinery Corp., capitalized at $500,000, has been chartered in Delaware to manufacture machinery, by M. H. Allen, L. A. Barney and F. M. Hunter.

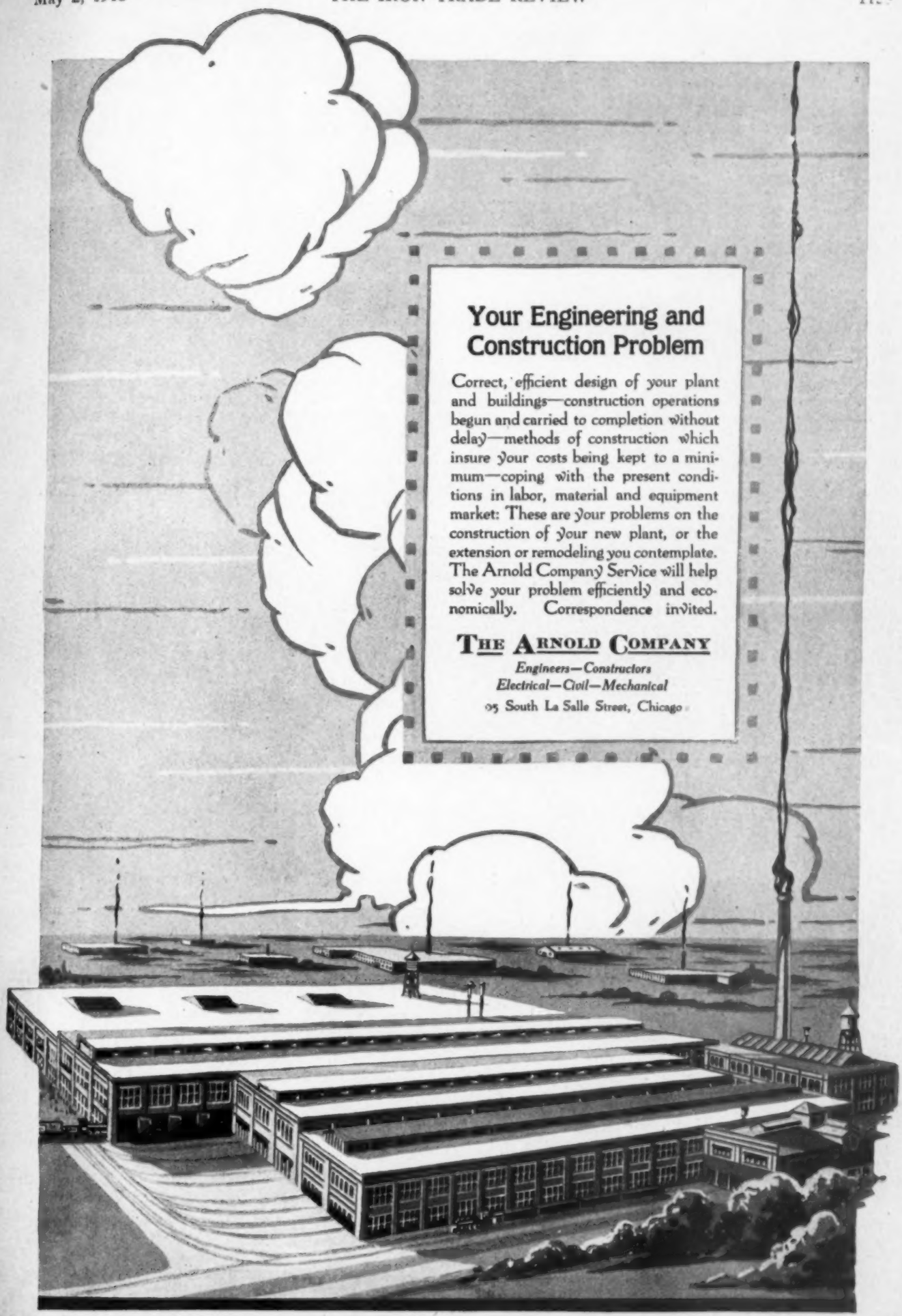
MINNEAPOLIS, MINN.—The Pence Automobile Co., 800 Hennepin avenue, will build a 4-story warehouse, 75 x 140 feet, to cost $100,000. H. E. Pence is president.

CEDAR RAPIDS, IOWA.—The Denning Tractor Co., G. M. Averill, Security building, president, will build an addition.

DAVENPORT, IOWA.—The Emeis Mfg. Co., Iowa street, will build an addition to its machine shop.

DES MOINES, IOWA. — The Whitnell Mfg. Co., Inc., will build a plant to cost $25,000.

OSKALOOSA, IOWA.—A special election will be held May 20 on the proposition of building a waterworks plant to cost $400,000


Your Engineering and Construction Problem
Correct, efficient design of your plant and buildings—construction operations begun and carried to completion without delay—methods of construction which insure your costs being kept to a minimum—coping with the present conditions in labor, material and equipment market: These are your problems on the construction of your new plant, or the extension or remodeling you contemplate. The Arnold Company Service will help solve your problem efficiently and economically. Correspondence invited.
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Engineers—Constructors
Electrical—Civil—Mechanical
95 South La Salle Street, Chicago

T. H. Carlin is city clerk. Burns & McDonnell, Kansas City, Mo., are engineers.

SIOUX CITY, IOWA. — The Woodbury Co., Inc., will build a pipe manufacturing building, costing $350,000. H. Metz is president.

KANSAS CITY, MO.—The Butler Mfg. Co., 1324 Grand avenue, will build a 1-story factory, 126 x 270 feet.

NORTH KANSAS CITY, MO.—The Illinois Silo & Tractor Co., care D. T. Garber, Bloomington, Ill., has bought a site for a tractor assembling plant, 4 stories, 118 x 305 feet.

ST. LOUIS.—The Johnston Tinfoil & Metal Co., 6020 South Broadway, will build a 2-story plant, 80 x 107 feet, to cost $50,000. C. F. Dietering, 1320 Central National Bank building, is architect.

ST. LOUIS.—The Skinner Bros. Mfg. Co., capitalized at $150,000, has been chartered to manufacture ventilating equipment by Merrill G. Skinner, Charles W. Skinner and Fred Skinner.

EUREKA SPRINGS, ARK.—The city of Eureka Springs is planning to install oil engines and pumps in the waterworks plant.

SAN ANTONIO, TEX.—An election will be held soon on a bond issue of $150,000, for bridge construction. Hans Helland is city engineer.

BOWBELLS, N. DAK.—Bids will be received until May 1 by G. K. Melby, county auditor of Burke county, for metal culverts for county use in 1918.

LOS ANIMAS, COLO.—The board of county commissioners of Bend county, J. W. Nelson county clerk and recorder, will build a combination timber and steel bridge over Mud creek.

MOSCOW, IDAHO.—The Western Irrigation & Development Co., capitalized at $50,000, has been chartered to manufacture a water-lifting device and will build a plant near Moscow.

PROVO, UTAH.—The Salt Lake, Fillmore & Kanosh railroad has been incorporated to build a railroad from Lynndyl to Kanosh, 50 miles. George W. Craig, Provo, is president.

Up and Down the Pacific Coast

HOQUIAM, WASH.—The Lamb Machine Works is building a machine shop and foundry, each 80 x 140 feet, and will install an electric furnace.

KANASKET, WASH.—The county commissioners, Seattle, are planning a bridge over Green river with three alternatives: A Luten design and three concrete arches, one 90 feet and two 40 feet; a steel structure with one 129-foot span and two pony trusses of 40 feet; a timber and steel Howe truss 13 feet long and two 48-foot spans.

TACOMA, WASH.—The Atlas Foundry Co. will build a machine shop.

TACOMA, WASH. — The Seaborn Shipyards will build a machine shop, to cost $15,000.

BELL, CAL.—The Western Forge & Mfg. Co. has bought a site for a forging and drop forging plant to cost $50,000.

LONG BEACH, CAL.—The Long Beach Sheet Metal & Auto Works, 330 Locust avenue, is building an addition, 50 x 150 feet.

LOS ANGELES. — J. C. Coleman, 749 Maple avenue, will build a machine and assembling plant 120 x 209 feet.

LOS ANGELES.—The Staggard Radiator Corp. is soon to be in the market to purchase machinery, material and equipment with which to manufacture honeycomb radiators.

LOS ANGELES.—Wilbur O. Lusk proposes to build a combination ditch and pipe line 6½ miles long near Round Mountain, Shasta county, to develop 7500 kilowatts. It is proposed to use the same water for irrigation by means of a ditch and pipe line 30 miles in length, according to an application to appropriate waters filed with the state water commission. The cost of the combined projects is estimated at $250,000.

LOS ANGELES.—John Hays, 117 West Thirtieth street, secured a contract for the construction of the Second street tunnel for $956,882.73, of which $911,010 is for the tunnel proper and the remainder for the street work on the approaches. Among the individual items is one for steel reinforcement, $25,330.

NEVADA CITY, CAL.—The state highway commission has been authorized by the county supervisors to build a bridge across South Wolf creek on the state highway lateral at the county's expense.

OAKLAND, CAL.—The Rosenburg Iron & Metal Co., San Francisco, has bought a site and will equip a scrap yard including a locomotive crane.

OAKLAND, CAL.—The Scandia Pacific Oil Engine Co. will build a machine shop costing $18,000.

SAN FRANCISCO.—The board of public works will receive bids until April 24 for the iron work in connection with the yard at the southeast wing of the San Francisco hospital, estimated to cost $14,000. The bond has been fixed at $3500.

SAN FRANCISCO.—Palmer & Peterson, Monadnock building, have the contract for the construction of a concrete and steel building for the Union Iron Works in Alameda, Cal., for $60,000.

SAN PEDRO, CAL.—The board of education will build a machine shop, 70 x 100 feet, at the San Pedro high school.

STOCKTON, CAL. — The Samson Sieve Grip Tractor Co., 1104 South Aurora street, will build two additions costing $30,000.

STOCKTON, CAL.—The Harris Mfg. Co., Park and East streets, manufacturers of agricultural implements will build additions.

STOCKTON, CAL. — The county supervisors will receive bids until May 7 for alterations in the offices of the county treasurer and tax collector. A considerable amount of steel furniture is included in the proposed work.

YUBA CITY, CAL.—The construction of a movable span in the west end of Long Bridge over Butte Slough and the extension of 500 feet of new work on the eastern end of the same structure will be started at once as an emergency measure. The span was demanded by the state reclamation board to permit the passage of dredgers engaged in drainage and reclamation work. The improvements are expected to cost approximately $20,000. Supervisor Schellinger, of Sutter City, is in charge.

New Business in Eastern Canada

BLENHEIM, ONT.—E. W. Knight, Talbot street, has secured a site on which he will build a 2-story, brick and concrete garage and auto repair shop, to cost $10,000.

ORILLIA, ONT.—The E. Long Mfg. Co., manufacturers of sawmill machinery, tools, etc., Queen street, will build a 2-story factory, to cost about $60,000. W. W. McBain is secretary-treasurer of the company.

PORT ARTHUR, ONT.—J. Stirrett & Sons, 401 Eleventh avenue, is making preparations for the erection of a sawmill to cost including machinery, etc., approximately $60,000.

SAULT STE. MARIE, ONT. — R. O. Wynne-Roberts has been appointed consulting engineer to the town in connection with the installation of new electrically operated pumping plant.

TORONTO, ONT.—The Northlight Motor Co., Wesley building, will establish a plant in Toronto, for the manufacture of marine engines and is in the market for screw cutting lathe, large drill, planer, milling machine, 30-inch band saw; wood turning lathe, and universal wood trimmer.

TORONTO, ONT.—The Chapman Double Ball Bearing Co., 347 Sorauren avenue, will build an addition to its plant to cost $5000.

TORONTO, ONT. — Milton & Prentiss, Traders Bank building, are in the market for two vertical steam engines, 250 horsepower.

HALIFAX, N. S.—The Halifax Vulcanizing Works, 52 Argyle street, proposes to build a vulcanizing plant on Grafton street at a cost of $40,000. Albert Chappell is manager.

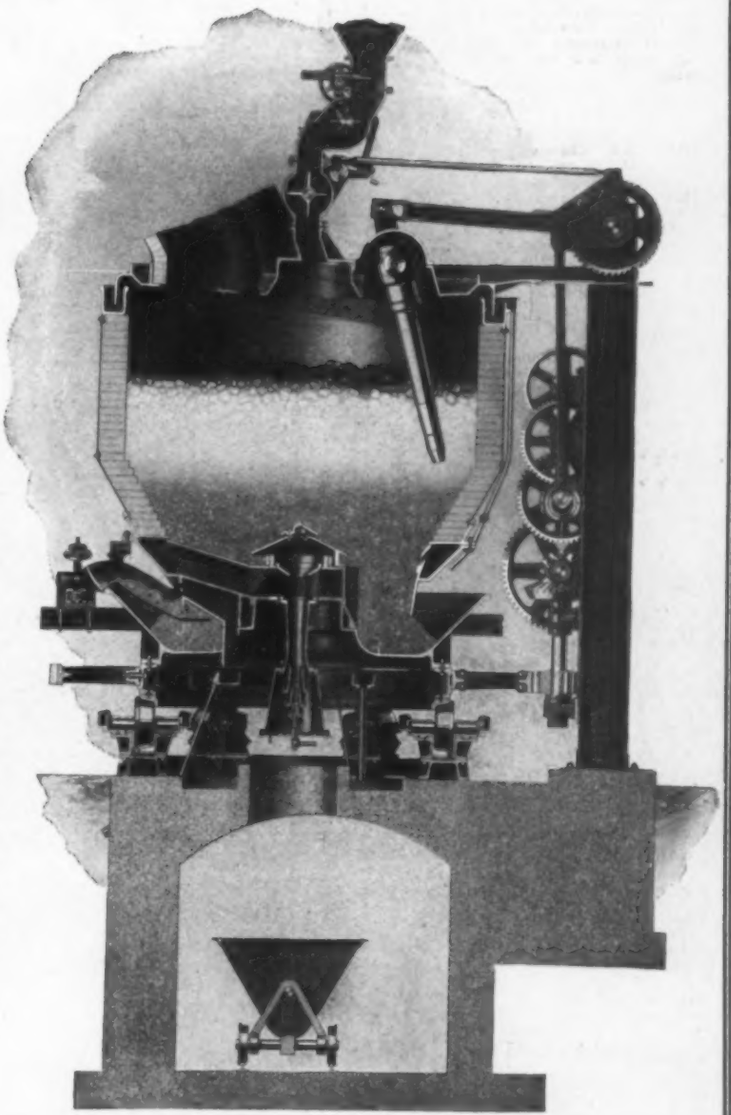
The Hughes Mechanical Gas Producer

REPEAT ORDERS
Indicate Satisfaction

A partial list of repeat customers showing number of Hughes Producers used by each.

Carnegie Steel Co.	119
American Steel & Wire Co.	56
Bethlehem Steel Co.	54
New Jersey Zinc Co.	42
National Tube Co.	41
Jones & Laughlin Steel Co.	40
Lackawanna Steel Co.	39
Indiana Steel Co.	38
Inland Steel Co.	36
Minnesota Steel Co.	36
Pittsburgh Steel Co.	36
American Sheet & Tin Plate Co.	32
Republic Iron and Steel Co.	32
American Rolling Mill Co.	30
Corrigan, McKinney & Co.	30

More than 1000 in use



Write for Bulletin A 4

Bulletin A 4 contains considerable information on the subject of producer gas and explains the Hughes Uniform Feed, Water Cooled Poker, Blowing, Mixing and other special features which contribute to its splendid performance. A copy is waiting your request.

THE WELLMAN-SEAVER-MORGAN CO.

CLEVELAND, OHIO, U. S. A.

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

WAREHOUSE PRICES

Steel bars, Chicago	4.10c
Steel bars, Cleveland	4.035c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.10c
Steel bars, New York	4.095c
Steel bars, St. Louis	4.17c
Steel bars, Cincinnati	4.085c
Steel bars, St. Paul	4.22c
Steel bars, Buffalo	4.05c
Iron bars, Buffalo	4.65c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	3.985c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.17c
Iron bars, Cincinnati	4.085c
Iron bars, Philadelphia	4.50c
Iron bars, New York	4.659c
Shapes, Chicago	4.20c
Shapes, Detroit	4.185c
Shapes, St. Louis	4.27c
Shapes, St. Paul	4.32c
Shapes, New York	4.195c
Shapes, Cleveland	4.135c
Shapes, Philadelphia	4.20c
Shapes, Buffalo	4.15c
Shapes, Cincinnati	4.185c
Plates, Buffalo	4.40c
Plates, Chicago	4.45c
Plates, Detroit	4.435c
Plates, St. Louis	4.52c
Plates, St. Paul	4.57c
Plates, New York	4.445c
Plates, Cleveland	4.385c
Plates, Philadelphia	4.45c
Plates, Cincinnati	4.435c
No. 10 blue anl. sheets, Chi.	5.45c
No. 10 blue anl. sheets, Cleve.	5.385c
No. 10 blue anl., Buffalo	5.40c
No. 10 blue anl., sheets, St. L.	5.52c
No. 10 blue anl. sheets, Cinci.	5.435c
No. 10 blue anl. sheets, St. Paul	5.57c
No. 10 blue anl. sh., Detroit	5.435c
No. 28 black sheets, Chgo.	6.45c
No. 28 black sheets, Cleve.	6.385c
No. 28 black sheets, Cinci.	5.45c
No. 28 black, Detroit	6.435c
No. 28 black sheets, St. L.	6.52c
No. 28 black sheets, St. Paul	6.57c
No. 28 galv. sheets, Chgo.	7.70c
No. 28 galv. sheets, Cleve.	7.635c
No. 28 galv. sheets, Cinci.	6.635c
No. 28 galvanized, Detroit	7.685c
No. 28 galv. sheets, St. L.	7.77c
Hoops, Cleveland	4.885c
Hoops, Detroit	4.935c

IRON AND STEEL SCRAP

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$22.50 to 23.00
Bundled sheets, Pittsburgh	22.00
Bundled sheets, Cleveland	23.50 to 24.25
Bundled sheets, Buffalo	24.00 to 25.00
Boiler plate, cut, No. 1, Chg.	24.50 to 25.50
Boiler plate, cut No. 1, St. L.	25.50 to 26.00
Frogs, switches, guards, St. L.	28.50 to 29.00
Frogs, switches, guards, Chgo.	29.00
Heavy melting steel, Pitts.	29.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	28.50 to 29.00
Heavy melt'g steel, Cleveland	29.00
Heavy melting steel, Cinci.	26.50 to 27.00
Heavy melt'g steel, east. Pa.	28.00 to 29.00
Heavy melting steel, N. Y.	26.75
Heavy melting steel, St. L.	26.50 to 27.00
Heavy melting steel, Birming.	23.00 to 25.00
Hydraulic press. sheets, Cleve.	28.50 to 29.00
Hydraulic press. sheets, Pitts.	26.00
Hydraulic press. sheets, Chgo.	26.00 to 26.50
Knuckles, couplers, Chgo.	34.00
Knuckles, coup., St. Louis	32.50 to 33.00
Low phos. steel, Buffalo	37.50
Low phos. steel, Pittsburgh	39.00
Low phos. steel, eastern Pa.	39.00
Shoveling steel, Chicago	28.00 to 28.50
Shoveling steel, St. Louis	26.50 to 27.00
Springs, Chgo.	34.00
Steel rails, short, Chicago	34.00
Steel rails, short, Cleveland	34.00
Steel rails, short, St. Louis	30.75 to 31.25
Steel rails, old, Birmingham	25.00 to 27.00
Stove plate, Chgo.	25.50 to 26.50
Stove plate, Cincinnati	20.00 to 20.50
Stove plate, St. Louis	22.50 to 23.00
Stove plate, N. J. points	23.75
Stove plate, Birmingham	20.00 to 22.00
Stove plate, Buffalo	24.50 to 25.00
Stove plate, eastern Pa.	23.00 to 24.00
Stove plate, Cleveland	25.00 to 25.50
Stove plate, Pittsburgh	22.00
Bundled sheets, Cincinnati	20.00 to 20.50

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Philadelphia	$3.27
New England	3.77
Brooklyn, Jersey City, Newark	3.52
Birmingham, Ala., to:	
Boston	6.00
Cincinnati	2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	6.00
Philadelphia (r. and w.)	5.25
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Minneapolis, St. Paul	2.00
Milwaukee	.50
Moline, Ill.	1.15
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis, St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	17.0 cents
Baltimore	18.0 cents
Cleveland	13.5 cents
Cincinnati	18.5 cents
Chicago	21.5 cents
Detroit	18.5 cents
Minneapolis and St. Paul	32.9 cents
Denver	82.5 cents
St. Louis	27.0 cents
New Orleans	30.7 cents
Birmingham	45.0 cents
Pacific coast (all rail)	$1.00
Pacific coast (tin plate)	1.00

IRON MILL USE

Angle bars, iron, Chgo.	38.50 to 39.00
Angle bars, steel, St. Louis	35.00 to 35.50
Arch bars, transoms, Chgo.	43.00 to 44.00
Arch bars and transoms, St. Louis	45.00 to 45.50
Busheling, No. 1, Cleveland	29.00 to 30.00
Busheling, No. 1, Buffalo	29.00 to 30.00
Busheling, No. 2, Buffalo	21.00 to 23.00
Busheling, No. 1, Pittsburgh	32.00
Busheling, No. 1, Cincinnati	25.00 to 25.50
Busheling, No. 1, Chgo.	29.00 to 29.50
Busheling, No. 2, Chgo.	19.75 to 20.75
Busheling, No. 1, St. Louis	27.00 to 27.50
Cast borings, New York	15.50 to 16.00
Cast borings, eastern Pa.	19.00
Cast borings, Cleveland	16.00
Cast borings, Buffalo	18.00 to 19.00
Cast borings, Cincinnati	15.50 to 16.00
Cast borings, Pittsburgh	19.00
Cast borings, Birmingham	12.00 to 13.00
Cast borings, Chgo.	17.50 to 18.00
Cast borings, St. Louis	16.50 to 17.00
City wrought, long, N. Y.	31.00
Cut forge, Chicago	31.00 to 32.00
Forge flashings, small, Cleve.	27.00 to 27.50
Forge flashings, large, Cleve.	27.00 to 27.50
Forge No. 1, eastern Pa.	26.50 to 27.50
Grate bars, Buffalo	24.50 to 25.00
Grate bars, Cleveland	25.50 to 26.00
Grate bars, N. J. points	23.75
Iron axles, Pittsburgh	46.50
Iron axles, Cincinnati	43.00 to 43.50
Iron axles, Cleveland	46.50
Iron axles, Chicago	46.50
Iron axles, eastern Pa.	46.50
Iron axles, St. Louis	46.00 to 46.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	38.00 to 39.00
Iron rails, Buffalo	36.00 to 37.00
Iron rails, Cincinnati	32.00 to 32.50
Iron rails, St. Louis	35.50 to 36.00
Iron rails, Cleveland	34.00
Machine turnings, Cincinnati	16.00 to 16.50
Machine turnings, Cleve.	16.00
Machine turnings, Buffalo	17.00 to 17.50
Machine turnings, N. Y.	15.50 to 16.00
Machine turnings, Pitts.	19.00
Machine turnings, east. Pa.	18.50 to 19.00
Machine turnings, Birming.	17.00 to 18.00
Machine turnings, Chicago	17.50 to 18.00
Machine shop turnings, St. L.	18.00 to 18.50
Pipes and flues, Cleveland	24.50 to 25.50
Pipes and flues, Chicago	26.50 to 27.00
Pipes and flues, St. Louis	25.50 to 26.00
R. R. mch. cast, No. 1, Buff.	34.00
R. R. wrgt. No. 1, Buffalo	34.00
R. R. wrgt., No. 1, east Pa.	34.00
Railroad wrgt. No. 1 Cinci.	33.50 to 34.00
Railroad wrgt., No. 1, Cleve.	34.00
R. R. wrought, No. 1, Pitts.	34.00
Railroad wr'ght, No. 2, Chgo.	31.00 to 32.00
Railroad wr'ght, No. 1, Chgo.	33.50 to 34.00
R. R. wrgt. No. 1, Birming.	25.00 to 27.00
No. 1 yard wrought East Pa.	33.00
No. 1 busheling wrgt., E. Pa.	31.00
Sheet wrought, Pittsburgh	34.00
Railroad wrgt., No. 1, St. L.	33.00 to 35.50
Railroad wrgt., No. 2	32.00 to 32.50
Wrought pipe, Buffalo	27.00 to 28.00
Wrought pipe, eastern Pa.	31.50 to 32.00
Wrought pipe, ungraded, eastern Pa.	29.00

IRON OR STEEL WORKS USE

Axle turnings, Cleveland	$24.00
Axle turnings, Buffalo	24.00
Heavy axle turn'gs, E. Pa.	24.00
Heavy axle turnings, Pitts.	25.00
Shafting, New York	35.50
Shafting, eastern Pa.	39.00
Steel car axles, Pittsburgh	46.50
Steel car axles, Birmingham	30.00 to 32.00
Steel car axles, New York	43.00
Steel car axles, Buffalo	44.00 to 46.00
Steel car axles, Cleveland	44.00
Steel car axles, eastern Pa.	46.50
Steel car axles, Chgo.	46.50
Shafting, St. Louis	37.50 to 38.00
Steel car axles, St. Louis	46.00 to 46.50

IRON FOUNDRY USE

Car wheels, (iron), Pitts.	$29.00
Car wheels, (steel), Pitts.	34.00 to 35.00
Car wheels, eastern Pa.	29.00
Car wheels, Buffalo	29.00
Car wheels, Chicago	29.00
Car wheels, St. Louis	28.50 to 29.00
Car wheels, Birmingham	25.00 to 28.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	21.50 to 24.00
Cast, No. 1, cupola east. Pa.	33.00
Cast, No. 1, Birmingham	23.00 to 25.00
Cast, No. 1, Cleveland	31.50
Cast No. 1, Cincinnati	29.00 to 29.50
Cast, 1, heavy, N. J. points	32.25 to 32.75
Cast, 1, machy., N. J. points	32.50 to 32.75
Cast, No. 1, Chicago	30.50 to 31.00
Cast, No. 1, Pittsburgh	32.50 to 33.00
Cast, No. 1, St. Louis	25.00 to 25.50
Malleable, Cincinnati	30.00 to 34.00
Malleable, Cleveland	30.00 to 34.00
Malleable, Buffalo	29.00 to 34.00
Malleable, Pittsburgh	33.00 to 34.00
Malleable, east. Pa.	29.00
Malleable, cupola, East Pa.	32.00
Malleable railroad, Chgo.	32.00 to 33.00
Malleable, agricultural, Chgo.	31.00 to 31.50
Malleable railroad, St. Louis	28.00 to 28.50
Malleable agricultural, St. L.	27.25 to 27.75

MISCELLANEOUS USES

Boiler punchings, Chgo.	34.00
Reroll. rails, 5 ft. & ov., Pitts.	34.00
Reroll. rails, 5 ft. & ov., Chgo.	34.00
Reroll. rails, 5 ft. & ov., E. Pa.	34.00
Reroll. rails, 5 ft. & ov., St. L.	33.50 to 34.00
Reroll. rails, 5 ft. or over, Cleve.	34.00
Rerolling rails, long, Birm.	37.50 to 38.50
Locomotive tires, Chgo.	42.00 to 43.00
Locomotive tires, St. Louis	40.50 to 41.00